A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI.

A DISSERTATION SUBMITTED TO THE TAMILNADU
Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI,
IN PARTIAL FULFILLMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

MEDICAL SURGICAL NURSING (Critical Care Nursing)

BY

301612652

SRESAKTHIMAYEIL INSTITUTE OF NURSING AND RESEARCH

(JKK NATTRAJA EDUCATIONAL INSTITUTIONS)

KUMARAPALAYAM (PO),

NAMAKKAL DISTRICT – 638 183.

OCTOBER – 2018

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EXAMINERS:

1. ……..

2. …….

DECLARATION

I hereby declare that this dissertation entitled **"A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".** It has been prepared by me under the guidance and supervision of **Dr.R.Jamunarani, Ph.D,** Principal Sresakthimayeil Institute of Nursing and Research, Kumarapalayam. **Mrs.B.Gowri, M.Sc, Nursing, Head of the department (Medical Surgical Nursing)**, Sresakthimayeil Institute of Nursing and Research, Kumarapalayam. As a partial fulfillment of Master Science in Nursing degree under The TamilNadu Dr.M.G.R Medical University, Chennai this dissertation had not been previously formed and this will not be used for award of any other degree. This dissertation represents independent original work on the part of the candidate.

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ABSTRACT

Back ground: The nature of chemotherapy drugs (cancer chemotherapeutic drugs, anti neoplastic agents or cytotoxic drugs) makes them harmful to healthy cells and tissues as well as cancerous cells. For cancer patients with a life-threatening disease, treatment with these agents can be beneficial However, for researchers and workers who are exposed to chemotherapy drugs as part of their work, precautions must be taken to eliminate or reduce the potential for exposure as much as possible. Chronic effects that have been identified in patients given these drugs include cancer, infertility, miscarriage, birth defects, damage to the liver and kidney, bone marrow, the lungs and heart, and hearing impairment. Principal Investigators (PIs) are required to assess the exposure hazards of their work with chemotherapy and other hazardous drugs to determine the appropriate precautions and controls to be taken. **Objectives:** To assess the level of knowledge regarding safe handling and administration of chemotherapeutic drugs before and after Structured teaching programme**.** To find the effectiveness between post test knowledge regarding safe handling and administration of chemotherapeutic drug among staff nurses with selected demographic variables. **Methodology:** The study was conducted in SIMS Hospitals, Chennai. **The research design** used for this study was Pre experimental- pre test and post test design .30 samples were selected through purposive sampling technique .A structured interview schedule was used to collect the data on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses for pre test followed by that structured teaching on safe handling and administration of chemotherapeutic drugs has been

given. Post test was conducted after one week by using the same questionnaire. The data was analyzed by using descriptive and inferential statistics. **Findings**: The demographic variables associated on the basis of knowledge are professional education on safe handling and administration of chemotherapeutic drugs. The pre test knowledge level of mean was assessed among staff nurses, mean was 11.58 standard deviation was 1.22 that shows the staff nurses were in poor knowledge. After structured teaching programme, the post test knowledge level of mean was 21.2, and standard deviation was 1.68 that shows the staff nurses knowledge level was highly improved. And difference in mean percentage of pre and post test knowledge level was 39% and difference in mean percentage it seems to be the study was effective to the staff nurses regarding safe handling and administration of chemotherapeutic drugs. Comparison of pre and post test level of knowledge was analyzed by using paired 't' test. **Conclusion**: The study proves that structured teaching programme on safe handling and administration of chemotherapeutic drugs was effective in improving the knowledge.

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CHAPTER – I

INTRODUCTION

"The goal of chemo drugs is to poison the cancer before killing the patient,"

O'Keefe

Chemotherapy (chemo) usually refers to the use of medicines or drugs to treat cancer. The thought of having chemotherapy frightens many people. But knowing what chemotherapy is, how it works and what to expect can often help calm your fears. It can also give you a better sense of control over your cancer treatment.

Chemotherapy was first developed at the beginning of the 20th century, although it was not originally intended as a cancer treatment. Cancer is leading cause of death worldwide, whereby more than 10 million people are diagnosed with cancer and 6 million deaths take place annually. It has been estimated that there will be 15 million new cases every year by 2020. The disease burden is much higher in Pakistan than developed countries. The current data on cancer incidence is not available due to unavailability of regular cancer registry system at national level in Pakistan, according to last available figures of 1998, the rate of incidence for all cancers is 132.4/100,000 for males and 133.0/100,000 for females

During World War II, it was discovered that people exposed to nitrogen mustard developed significantly reduced white blood cell counts. This finding led researchers to investigate whether mustard agents could be used to halt the growth of rapidly dividing cells such as cancer cells.

Cytotoxic drugs are used in the therapy of various neoplastic conditions, organ transplantation, and collagen vascular disorders and are used in oncology, radiotherapy, transplant, and immunology units. Their use in other hospital departments and outside the hospital in clinics and elsewhere is also increasing owing to increase in the incidence of carcinomas, transplants, and immunological diseases.

Chemo agents have been classified as “hazardous drugs” by the **Occupational Safety and Health Association (OSHA.)** Hazardous drugs are those known, or suspected to cause cancer, miscarriages, birth defects, or other serious health consequences.

Dr.Ananya Mandal,.MD The scientists found that the patients tumour masses were significantly reduced for a few weeks after treatment and although the patient had to return to receive more chemotherapy, this marked the beginning of the use of cytotoxic agents for the treatment of cancer. The initial study was done in 1943 and the results were published in 1946.

Chemotherapy is a kind of treatment that uses drugs to attack cancer cells. It is called a "systemic treatment" since the drug, entering through the blood stream, travels throughout the body and kills cancer cells at their sites. The drugs may rarely be intended to have a local effect, but in most cases, the intention is to destroy cancer cells wherever they may exist in the body. Since chemotherapy also affects normal actively dividing cells such as those in the bone marrow, the gastrointestinal tract, the reproductive system and in the hair follicles, most patients experience some degree of side effects like nausea, vomiting, hair loss, mouth sores, ulcers.

Jacobsenetal., 2012 The **American Society of Clinical Oncology (ASCO)** and the **Oncology Nursing Society (ONS)** have developed specific safety standards for the administration of chemotherapy. These standards require that each institution utilize a comprehensive educational program and monitor nursing competency at specific intervals.

Salpaka, (2000) Unfortunately, most chemotherapy centres require initial education and training programs but have not developed a common method to evaluate nursing competency in regard to safe-handling techniques. Given such, it is imperative that institutions dispensing chemotherapy initially engage staff and develop evaluation and safe-handling strategies that continue over time.

Polovich & Clark, (2012). Although guidelines for chemotherapy administration exist and are maintained by the Oncology Nursing Society and the American Society of Health System Pharmacists, evidence suggests that work environments are still contaminated with chemotherapeutic drugs due in part to poor nursing compliance

This suggests that a gap may exist between evidence-based recommendations for current practice and what is actually practiced in the clinical setting.

Most chemotherapeutic agents are both toxic and mutagenic. Alkylating agents have been associated with the highest risks to handlers. Organ damage and increased risk of fetal loss have been reported in persons handling and administering chemotherapy with inadequate attention to personal safety. This was first suspected in the 1970's when chemotherapy drugs had already been in clinical use for 2 decades, and unfortunately (as in many other industries) many healthcare workers were exposed to hazardous substances that led to illness and even deaths among those workers.

The success of pharmacologic agents in treating a wide variety of acute and chronic diseases is well-documented. Their risks and potential to cause side effects in the patients being treated is equally well-recognized. For certain drugs, this risk extends to pharmacists and other health care workers who handle the drugs, even after exposure to only small concentrations.

Exposure to hazardous agents can occur during the preparation, administration, or disposal of these drugs when health care workers create aerosols, generate dust, clean up spills, or touch contaminated surfaces. For pharmacists handling and dispensing oral chemotherapy, a number of activities in these processes may result in exposure through inhalation, skin contact or absorption, or inadvertent ingestion

Whereas inhalation and skin contact or absorption are the most common routes of exposure from powder or residue from tablets or capsules, unintentional ingestion can occur through hand-to-mouth contact with these powders or residues. The amount and frequency of exposure to hazardous drugs parallels the risk for adverse effects, but no single biological marker has been found to be a reliable predictor of exposure or adverse effects on health.

In fact, the **Occupational Safety and Health Administration (OSHA)** in 1986 released recommendations for hospitals and their employees to always use high levels of protective equipment when working with chemotherapy patients and/or their bodily wastes.

Every day in healthcare settings across America, workers are exposed to hundreds of powerful drugs used for cancer chemotherapy, antiviral treatments, hormone regimens and other therapies," according to a 2011 letter written jointly by **OSHA** and the **National Institute for Occupational Safety and Health (NIOSH)** to health-care professionals. "While these drugs are used to relieve and heal patients, many of them present serious hazards to the health and safety of your workers. Some of these drugs have been known to cause cancer, reproductive and developmental problems, allergic reactions and other adverse effects that can be irreversible even after low-level exposure."

Chemotherapy, because of its relatively narrow therapeutic index, is often associated with a greater risk of adverse events (AEs) than other medications, and when used in combination, may result in an even greater incidence of AEs. In

contrast to administration in the institutional setting, where the prescribed medication, dose, regimen, and response to therapy are subject to several levels of assessment, patient or caregiver (defined as family members or friends who assist the patient) administration of oral chemotherapy is more likely to be susceptible to errors, non adherence, and increased AEs as a result of a lack of coordinated care.

Although there are no publications comparing chemotherapy errors that occur with oral versus intravenous administration, known issues with oral administration include incorrect dosing and limited monitoring, which can lead to under dosing or overdosing, serious toxicity, morbidity, and mortality. In addition, patient non adherence to oral chemotherapy is a significant problem, which is less of a concern with paraenteral therapy given in an institutional setting under the supervision of health care professionals. Finally, AEs may be difficult to monitor with the personal administration of oral chemotherapy if fewer clinic visits are needed for drug administration purposes; thus, it is crucial to inform the patient of the known AE profile associated with the medication.

Accidental exposure to oral chemotherapeutic agents can occur at various stages during handling (ie, transport, unpacking, storage, handling, administration, and disposal). Thus, guidelines for safe and appropriate handling across the health care continuum are imperative. Some of the existing recommendations to ensure the safe storage, prescribing, dispensing, administration, and disposal of cytotoxic oral chemotherapy drugs. However, the recommendations have not been universally accepted or incorporated into practice. Recent surveys of health care practitioners as well as patients found that the perception of oral chemotherapy being safer than

intravenous chemotherapy was prevalent. In addition, a survey of pharmacy directors of National Cancer Institute–designated cancer centres published in 2007 identified gaps in pharmacy practices, safety assessments, and prescribing methods and demonstrated the need for safe practice guidelines

Tracing an individual's cancer to a particular exposure is difficult. It's one of the main reasons safety advocates have been thwarted in their efforts to get stricter regulations. But many who study these agents fear lax safety standards are resulting in ongoing exposures that continue to put current workers at future risk.

A just-completed study from the **U.S. Centers for Disease Control**, 10 years in the making and the largest to date, confirms that chemo continues to contaminate the workspaces where it's used, and in some cases is still being found in the urine of those who handle it, despite knowledge of safety precautions.

"There is no other occupation population (that handles) so many known human carcinogens," said **Thomas Connor**, a research biologist with the National Institute for Occupational Safety and Health. Connor has spent 40 years studying the effect of chemo agents on workers, and is one of the lead authors on the latest study.

Adverse effects of hazardous drugs through occupational exposure were first reported nearly 30 years ago, when an increased incidence of genotoxicity was documented in pharmacists and nurses handling antineoplastic drugs. Studies also established an association between exposure to chemotherapy drugs and increased fetal loss, congenital malformations, and infertility among health care workers. In

addition, an increased risk for leukemia among oncology nurses and physicians exposed to antineoplastic drugs was found in a Danish cancer registry. Therefore, establishing guidelines and subsequent adherence are essential to safeguarding all health care professionals regardless of practice setting.

Despite awareness of the occupational risks for the harmful effects of chemotherapy drugs for more than 20 years, reports continue to document exposure of health care workers. Currently, no standardized national guidelines exist for the safe handling of oral chemotherapy agents in either traditional or non traditional health care settings, and no single institutional policy can serve as an adequate model.

NEED FOR STUDY

Cancer is currently the leading cause of death worldwide accounting for approximately 8.2 million deaths in 2012. The global cancer burden is projected to continue rising with 23.6 million new cases expected to be diagnosed annually by the year 2030. In Kenya, cancer takes third place in major causes of death in the country. With cancer cases on the rise, the overall use of cytotoxic drugs and other treatment modalities is expected to rise to cater for the new cancer cases.

A study shows that especially nurses are exposed while preparing and administrating the CDs (cytotoxic drugs). The level of knowledge of the nurses about antineoplastic drugs is not satisfactory. The awareness of the nurses handling the CDs (cytotoxic drugs) is of concern because it is important in raising standards

of safety. In service training is a very effective tool to increase the level of knowledge. This study revealed also the necessity of the improvement of the work environment and the availability of the protective equipment. As the primary prevention measures involve the least possible exposure to CDs (cytotoxic drugs), information regarding the updated guidelines should be disseminated both at the practice and administration levels. For that reason nurses' information about the possible toxicities and the protection measures used while preparing and administering these drugs is gaining more and more importance.

It has therefore become imperative that staffs are knowledgeable regarding the safe handling of antineoplastic drugs. The risk to health care professionals from handling a hazardous drug stems from its inherent toxicity and the extent to which workers are exposed to the drug. The primary routes of exposure are through direct skin contact and through inhalation of aerosolized drug products. Other potential exposure occurs during the disposal of the drugs, disposal of the items used in drug preparation and administration, and when caring for patients who have received these drugs.

Although the absolute risk cannot be eliminated, much can be done to reduce the relative risks associated with the handling of antineoplastic agents Health care professionals who handle antineoplastics are advised to be well informed of the potential health hazards, be familiar with safe handling and disposal of these agents, utilize appropriate protective equipment and adhere to available written policies, procedures and guidelines.

The issue of medication safety is highly significant when anti-cancer therapy is used as a treatment modality due to the high potential for harm from these agents and the disease context in which they are being used. Medication errors can occur for a number of reasons, but the application of specific guidelines and procedures clearly reduces the incidence of errors along with a multidisciplinary approach.

Exposure to hazardous chemicals in the workplace is a significant occupational problem for nurses. Nurses and other HCWs (health care workers) are subject to HD (hazardous drug) exposure during routine activities related to patient care. Exposure is associated with a risk of adverse health outcomes. Use of safety precautions can reduce nurses' HD (hazardous drug) occupational exposure.

Given the potentially serious consequences of HD (hazardous drug) exposure, one would expect that the use of safe handling precautions is high; however, safe handling precautions have neither been universally implemented by all nurses nor in all settings. Several studies on PPE use have been published since 1986, and all reported glove and gown use that was lower than current recommendations. These Studies reported variation in PPE use by nurses based on the type of HD handling activity. Glove use ranged from 49-99% for drug preparation and 15-94% for drug administration; while gown use ranged from 3-63% for drug preparation and 3-31% for drug administration.

Despite the availability of safety guidelines for more than twenty years, use of Protective equipment is less than ideal. Recent studies found that 25-40% of nurses used improper gloves for chemotherapy handling and up to 69% of nurses

failed to wear gowns. The reasons that some nurses do not incorporate safety precautions into their practice are not fully understood. Knowledge about nurses' decision to use safety precautions is necessary to provide guidance in designing interventions to increase their use and reduce hazardous exposures.

Occupational exposure to hazardous drug (HDs) has been associated with acute symptoms have been reported in nurses and pharmacists who were occupationally exposed to HDs. These include hair loss, abdominal pain, nasal sores, contact dermatitis, allergic reactions, skin injury, and eye injury. More recently; it was found that exposed nurses were significantly more likely to report a cancer diagnosis than unexposed nurses.

In that study, the nurses' age at initial cancer diagnosis was younger than that reported in the Surveillance, Epidemiology, and End Results Data.

A self-rating questionnaire was mailed to 939 nurses in 107 university hospitals, 13 cancer-special hospitals, and 193 general hospitals with over 300 beds and at least five or more clinics in Japan. A total of 571 female nurses responded to the questionnaire. About 40% of the nurses were not at all aware of the potential adverse effects of occupational exposure to anticancer drugs. Eighty-eight percent of the nurses prepared anticancer drugs in the hospital wards; in most cases, nurses, not doctors or pharmacists, transported and administered such drugs to cancer patients. Regarding safety, 39% of the nurses took protective countermeasures against anticancer drugs; 15% paid special attention to the handling environment; 10% had guidelines for the handling of anticancer drugs; and, only 7% took countermeasures

with body fluids or linen handling of cancer patients. Although 82% of the nurses were concerned about the potential health effects of occupational exposure, 75% or over did not know whether the exposure might affect their future health or progeny. Awareness of adverse effects was significantly related with precaution in anticancer drug handling, for which 95% of the nurses stated a desire for special education and training.

Exposure to chemotherapeutic drugs is associated with many adverse outcomes for occupationally exposed individuals including but not limited to: contact dermatitis; deoxyribonucleic acid (DNA) damage; chromosomal abnormalities; fetal loss; infertility; preterm births; and an overall increase in ones personal risk for cancer (**Polovich & Clark, 2012).**

This study was to carry out genotoxicity monitoring of nurses from the oncology department of a hospital in South India, occupationally exposed to antineoplastic drugs under routine working conditions. The level of genome damage was determined in whole blood with the comet assay as well as micronucleus test (MNT) and in buccal epithelial cells with MNT alone of 60 nurses handling antineoplastic drugs and 60 referents matched for age and sex. Urinary cyclophosphamide (CP), used as a marker for drug absorption, was also measured in the urine of the nurses. The DNA damage observed in the lymphocytes of exposed nurses was significantly higher than the controls. Similarly, a significant increase in micronuclei (MN) frequency with peripheral blood lymphocytes and buccal cells was observed in the exposed nurses compared to controls ($P < 0.05$). Multiple regression analysis showed that occupational exposure and age had a significant

effect on mean comet tail length as well as on frequency of MN. The mean value of CP in urine of the nurses handling antineoplastic drugs was (mean +/- standard deviation; 0.44 +/- 0.26 microg/ml). Our study has shown that increased genetic damage was evident in nurses due to occupational exposure to antineoplastics. This data corroborate the need to maintain safety measures to avoid exposure and the necessity of intervention in the case of exposure when using and handling antineoplastic drugs.

An early study found that the urine of nurses who handled certain antineoplastic drugs was mutagenic, and this urinary mutagenicity increased during the work week and decreased during the weekend when they were away from work. Another study found increased mutagenic activity in pharmacy personnel preparing these agents. Other studies found increased levels of DNA damage in nursing and pharmacy personnel who handled these drugs.

There is much less data regarding cancer occurrence in health care workers who are exposed to antineoplastics. This may be partly due to longer latency period from time of exposure to tumor development. There has been an increased risk of leukemia reported among Danish physicians who were employed at least six months in a department where patient were treated with anticancer agents, and in oncology nurses.

Another study reported on the occurrence of liver injury in three head nurses who handled antineoplastic drugs for 6, 8 and 16 years, respectively, as there was an

absence of alcohol and drug use by these individuals, their illness was attributed to their exposure to anti cancer drugs.

According to **Martin and Larson (2003),** nursing adherence to safety guidelines has often been in question in the past and clear evidence is lacking in regard to nurses‟ level of knowledge and compliance with existing safe administration practices. Also, it should be noted that in regard to nurse safety and the administration of chemotherapeutic agents only recommended guidelines have been established, not well-recognized, mandatory safety standards.

Nurses must be aware of the safe handling of chemotherapeutic drugs, which include assessment of drug preparation, administration and disposal. Many don't have adequate knowledge about the effects because they are not aware of the literature, while others may be aware of the problem and are either very concerned about it, they believe that their workplace is safe.

The occupational safety requirements in the management of cancer has motivated the researcher to conduct a study to determine the effectiveness of nurses administering chemotherapy through intravenous administration by providing them sufficient knowledge in the practice of chemotherapy, thereby helping them protect themselves as well as the patients undergoing the treatment, from the harmful exposures, to create a safe working environment and to empower them to manage any complications.

Over the past decades, several standards, regulations and guidelines have been proposed to control occupational exposure to cytotoxic drugs those cover all aspects including administrative control, engineering control and personal protective equipment. So far, few studies have been conducted about the complications of exposure to antineoplastic drugs and the health care workers' compliance with national and international guidelines. To the best of our knowledge, little is known about the staffs safety and their compliance with the standard regulations. **(Christopher R Friese,etal., 2011)**

Unintentional chemotherapy exposure can affect the nervous system, impair the reproductive system and bring an increased risk of developing blood cancers in the future. These exposures are as dangerous to a nurse's health as being accidentally stuck with a needle. "Now a days needle stick incidents have minimized so they are rare events that elicit a robust response from administrators. Nurses go immediately for evaluation and prophylactic treatment if this happens. But we don't have that with chemotherapy exposure. **(Live science, 2011)**.

Nurses' Health Study, A recent major study has found the rate of spontaneous abortion in nurses who handle chemotherapy drugs to be twice that of nurses who did not handle the drugs. Past studies have reported similar results, but this study, a partnership between the National Institute for Occupations Safety and Health (NIOSH) and the Nurses' Health Study, looked at pregnancy outcome and occupational exposures retrospectively from 8,461 participants in the Nurses' Health Study. Participants reported 6,707 live births and 775 (10%) spontaneous abortions (less than 20 weeks).6 Many chemotherapy drugs are considered hazardous to

healthy people. That's why the nurses and doctors who give chemotherapy will take precautions to avoid direct contact with the drugs while giving them to you.

Research has showed that nurses are the key persons who will confront the effects of the cytotoxic drugs while they are administering it. Since the investigator has worked in oncology department where nurses are having knowledge regarding the administration of cytotoxic drugs, in spite of this they are utilizing only preventive measures like gloves and masks for the administrating of drugs which is not only sufficient to be safe from the hazardous effect of these drugs. In addition to it, if there is any emergency situation they are not able to practice the safe handling criteria which might lead them to develop health related problems in their future, so the researcher thought of under taking the task of assessing the knowledge of all the nurses to improve their knowledge regarding safe handling of cytotoxic drugs to reduce the further incidence of adverse reaction of hazardous drugs.

STATEMENT OF PROBLEM

A Study to assess the effectiveness of structured teaching programme on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses in selected hospital, Chennai.

OBJECTIVE OF THE STUDY

1. To assess the level of knowledge on safe handling and administration of chemotherapeutic drugs before and after structured teaching programme.

2. To evaluate the effectiveness of structured teaching programme regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

3. To determine the association between the post test knowledge scores on safe handling and administration of chemotherapeutic drugs with their selected socio demographic variables.

HYPOTHESIS

H_1 : There will be significant difference between the pre-test and post –test knowledge scores.

H_2 : There will be significant association between the level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses and their selected socio demographic variables.

OPERATIONAL DEFINITION

1. Effectiveness

It refers to the degree to which objectives are achieved and the extent to which targeted problems are solved.

2. Structured teaching programme

It refers to the set of teaching material prepared in English regarding safe handling of chemotherapeutic drug administration, developed by investigator and validated by the experts.

3. Knowledge

It refers to the appropriate response by the staff nurses on knowledge regarding on safe handling and administration of chemotherapeutic drugs through structured knowledge questions.

4. Safe handling

It refers to the process in which health care workers adhere to evidence-based practices (EBP) set forth by national organizations that have been designed to eliminate or significantly reduce occupational exposure to hazardous drugs.

5. Intravenous

It refers to the administration of the prescribed drug through a selected vein .

6. Chemotherapy

It refers to the administration of intravenous drug as prescribed for treating cancer.

ASSUMPTIONS

It is assumed that:

- Most of the staff nurses have some knowledge on safe handling and administration of chemothrapeutic drugs.

- Knowledge of staff nurses on safe handling of chemotherapeutic drugs and administration varies with the frequency and duration of treatment.

- Preparation of the structured teaching program will enhance the knowledge on safe handling of chemothrapeutic drugs administration.

CONCEPTUAL FRAMEWORK

The conceptual frame work of this study is based on **Widen Bach Theory**. It helps to provide a way of understanding and predicting how clients behave in relation to the health and how they will comply with health care therapies. There are four components present. The first component perceives identification or need for help. The second component is ministration of help needed. The third component is validation of help needed. The Widenbach theory address the relationship between a person believes on health disease and how patient acts nurses using this approach can better understand factors that influence ones perception and beliefs and the individual behaviours in order to plan care that will most effectively assist individual in maintaining health and preventing illness.

In this study lack of knowledge on safe handling and administration of chemotherapeutic drugs among staff nurses results in poor perception about administration of chemotherapeutic drugs .The structured teaching programme is done by SIMS hospital about definition, types of chemo drugs, toxicity of drugs, routs of administration, safety precautions, side effects, complication etc

Improvement in knowledge to perceive the identification of safe handling and administration of chemotherapeutic drugs among staff nurses.

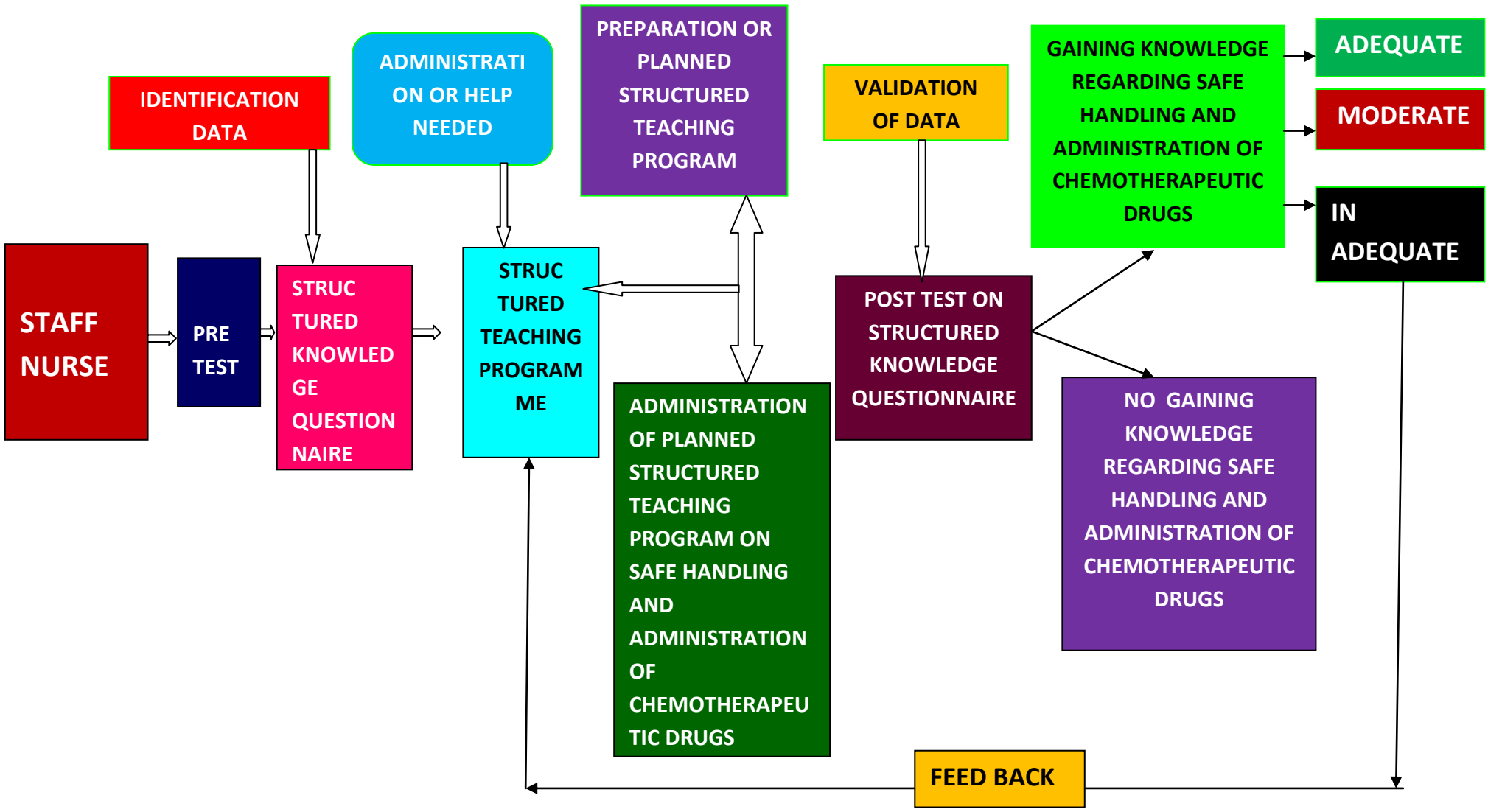

FIG. 1.1: CONCEPTUAL FRAME WORK WIDENBACH THEORY

CHAPTER – II

REVIEW OF LITERATURE

A literature review surveys books, scholarly articles, and any other sources relevant to a particular issue, area of research, or theory, and by so doing, provides a description, summary, and critical evaluation of these works in relation to the research problem being investigated. Literature reviews are designed to provide an overview of sources you have explored while researching a particular topic and to demonstrate to your readers how your research fits within a larger field of study.

The literature review for the present study is based on an extensive survey of books, journals and the web. It has been organized under the following headings:

1. Studies related to knowledge on chemotherapy among staff nurses

2. Studies related to safe handling of chemotherapy

3. Studies related to management of side effects of chemotherapy

1. STUDIES RELATED TO KNOWLEDGE ON CHEMOTHERAPY AMONG STAFF NURSES

Mahon, S. M., et.al., (2009) conducted a descriptive study in St. Louis University Hospital to describe how 103 nurses from a local Oncology Nursing Society implemented Occupational Safety and Health Administration Guidelines for

handling cytotoxic drugs in their individual practices and to identity barriers to implementing these guidelines. In sum, barriers must be overcome and better safe handling practices incorporated to ensure the safety of nurses.

Nirenberg, A., et.al., (2010) conducted a descriptive survey to describe oncology nurses use of National Comprehensive Cancer Network Clinical Practice Guidelines for chemotherapy induced neutropenia and febrile neutropenia among 309 Oncology Nursing Society members. The findings gave an insight into workplace barriers to evidence based practices in various settings.

Ashley, L., et.al., (2011) conducted a prospective study on systems-focused clinical risk assessment among 8 nurse lead multi-disciplinary teams for improving the standard of chemotherapy administration in large urban hospitals in United Kingdom. It aims to identify and generate remedial structure to counteract errors occurring during chemotherapy administration. The process outcome revealed that nurses collectively improved the procedure of chemotherapy administration.

Gerald Berenson.L., et. Al., (2011) conducted a mixed method research study to explore the knowledge and attitude of Saudi nurses towards chemotherapy, the samples of chemotherapy side effects among 100 nurses in Jeddah hospital in oncology/ hematology units. The results show that knowledge is weakest component of 50% and the attitude is strongest component of 66%. Saudi nurses about chemotherapy and concluded that nurses have to improve their knowledge regarding chemotherapy .

Lua Pei Lin, et al., (2012) A cross-sectional study was conducted to assess the effectiveness of knowledge regarding breast cancer and chemotherapy among 239 health science students from local public university in Terengganu, Malaysia. Data collected based upon breast cancer and chemotherapy questionnaires (BCCQ). The result shows that majority of students (71.1%) possessed a moderate level of knowledge related to breast cancer and chemotherapy in that 33.1% were unaware of different modes for chemotherapy administration. This study has generally ascertained that knowledge related to breast cancer and chemotherapy among this sample population remains moderate and is not uniformly disseminated. An increase in knowledge is required to ensure an optimal level of knowledge particularly for the junior students and those from courses other than nursing.

Yu HY.M, et al., (2013) conducted a study A total of 203 nurses participated in the study and achieved an average overall correct answer rate of 60.9%. Most of the respondents, 63.5% (129 of 203), had a score of less than 70, and 77.3% (157 of 203) hoped to undergo more training on chemotherapy. Their knowledge of chemotherapy came mainly from consultation with colleagues (4.0 ± 0.8) and in-hospital continuing education (3.9 ± 0.8).The evidence-based results suggested that nurses have insufficient knowledge about chemotherapy. More fundamentally, however, nurses need more education about chemotherapy in nursing school and through in-hospital continuing education.

Najmakhan.N., et.al., (2014) conducted an interventional study to measure the level of nurses knowledge and attitude after the education session regarding chemotherapy administration and management. The study was conducted at two

oncology units of tertiary hospitals, Rawalpandi. Pre-post test design was used 35 nurses were selected for the study. The mean score of knowledge were calculated by Cochran's test. Showed that knowledge scores have significantly increased with educational training (p value <0.001),the difference in the attitude of the nurses was not found to be statistically, significant in repeated measures of ANOVA. The result shows that knowledge is the weakest component and attitude is the strongest component of oncology nurses competences in chemotherapy administration .

Ali Taghizadeh Kermani, et.al., (2015) conducted a study in that 24 nurses participated in this short educational course, supervised by several clinical/radiation oncologists. During a two-week period, several protocols of chemotherapy, complications associated with chemotherapy, and the management of adverse outcomes were taught to the participants with a special emphasis on nursing considerations. Overall, Four participants (16%) were male and 20 (83%) were female. The majority of the subjects (90%) worked at chemotherapy wards. Sixteen (66%) versus twenty two (91%) nurses achieved a minimum score of 70% on MCQ before and after the course, respectively (p=0.03). The mean scores before and after the course were 18.7±8.6 versus 26±11 for MCQ (p=0.03) and 30.3±10 versus 45.3±14 for DOPS (p=0.004). The mean of attitudes' score were 3.93±1.7 and 4.04±1.2 before and after the course, respectively, that showed a significant difference (p=0.01). Short educational courses about major subjects in oncology nursing could improve nurses' knowledge and attitude.

Virendra Singh Choudhary, et.al., (2016) Structured self-administered questionnaire schedule to assess the knowledge and developed 4 point likert scale

was used on 50 staff nurses of selected with convenience sampling technique from cancer hospitals of Punjab. The results of the study shown that mean score of staff nurses regarding knowledge was average (14.94) and mean score of their attitude comes out to be positive(59.70). The association between knowledge and attitude with their selected socio-demographic variables was calculated by chi square test and revealed statistically non significant relationship ($p>0.05$).The intention of this study was to assess the knowledge and attitude of nurses' on nursing care of cancer patients undergoing chemotherapy. Overall, nurses appear to have average knowledge and a positive attitude towards nursing care of cancer patients undergoing chemotherapy. So enhancement in knowledge aspects is required and CNE program me or knowledge updating program me should be held time to time.

Lavanya B, et.al., (2017) conducted a quantitative descriptive design, Sample size was 30; out of which, 15 staff nurses and 15 nursing students were selected by using Non-probability convenience sampling technique. Study revealed that the level of knowledge among staff nurses, 9(60%) had inadequate knowledge, 4 (27%) had moderate knowledge and 2(13%) had adequate knowledge. Among nursing students, 13(87%) had inadequate knowledge, 2(13%) had moderate knowledge and none of them had adequate knowledge regarding chemotherapy. Conclusion: The study concluded that staff nurses had better knowledge than nursing students on Care of Patients with Chemotherapy.

Sylvia E Nwagbo, **et.al., (2017)** conducted a cross sectional descriptive study design, based on Protection Motivation theory was conducted among 100 purposively selected nurses from oncology unit of the hospital. Data were collected

using a 54-item validated questionnaire. Descriptive and inferential statistics at 0.05 level of significance was used. Respondents were within 35.4 ± 5.1 years. More than half of the respondents had over 3 years practice in the oncology unit (mean 2.62, ± 1.1). Knowledge of chemotherapy among the cohort was high; mean 13.9 ± 2.2, 70 % understood the use of gloves and gowns as part of safety guidelines. On handling patients' clothes, only 57% understood that such should not be washed by hand or with other clothes. Cumulatively, 79.2% of the respondents knew about the safety guidelines, 4.7% had no knowledge while 16.1% were not sure of the correct guidelines for administering chemotherapy. Respondents' level of education was significantly associated with knowledge of chemotherapy, $P<0.05$; practice score was also significantly associated with respondents' cadre; $P<0.05$. Periodic and consistent update of nurses' knowledge supported by policies to enforce guidelines implementation is recommended.

Sevgisun Kapucu, PhD, et al., (2017) this descriptive study was started on April 15, 2015–July 15, 2015. The data presented in this summary belong to 165 nurses. Data were collected with data collection form including questions related to sociodemographic qualifications and knowledge levels of nurses. Data collection forms were E-mailed to the members of Turkish Oncology Nursing Society. Data presented with numbers, percentages, and mean ± standard deviation. The mean age of nurses was 33.60 ± 7.34 years and mean duration for oncology nursing experience was 2.65 ± 0.91 years. Nurses had correct information about the importance of selecting peripheral venous catheter and choosing the placement area for chemotherapy administration (63.6%), control of catheter before the administration (93.9%), influence of chemotherapeutic agent on length of catheter (40.6%), and

management of extra vasation (75.7%). Nurses also had correct information about the first use of port catheter (67.3%) and checking the catheter whether it is working properly or not (75.8%). In General, nurses' level of knowledge related to catheter is 50% and higher. It is recommended to increase the knowledge of nurses about evidence-based information for catheter care as a step to safe chemotherapy practice.

II. STUDIES RELATED TO SAFE HANDLING OF CHEMOTHERAPY

Jezewski, M. A., et.al., (2009) conducted a descriptive co relational study in New York to determine Oncology nurses knowledge, attitude and experience regarding advance directives, among 3840 oncology nurses of which 794 responded. The mean total knowledge score based on the 3 subscales was 17.4 of the possible 30. The result showed that nurse's knowledge scores were low, nurses in this study were not highly confident in their ability to assess patient with advance directives. More education related to advance directives is needed and could be administered through in service classes or continuing education.

McCaughan, E., & Parahoo, K., (2009) conducted a descriptive study among 106 nurses working in medical surgical department in the selected hospital at Ireland, regarding perceptions of their level of competence and educational need in caring for patients with cancer. Results showed that these nurses who cared for people with a varied range of cancer had above moderate level of competence, and they also rated that their level of competence is higher in physical care than in psycho-social care.Increasing institutional reorganization and financial support could improve nurses' certification rates and ultimately result in improved patient care.

Creaton, E. M., et.al., (2010) conducted a descriptive study among the inpatient oncology staff of St Elisabeth's hospital in Boston. The programme consist of theoretical and practical component in which in-patient oncology nursing staffs were highly motivated to expand their knowledge base for cancer patient care and expressed interest in chemotherapy administration.

Verity, R., et.al., (2010) conducted a descriptive study to explore the work of nurses who administer chemotherapy. The study was conducted across 26 London hospitals providing cancer services.244 nurses were the study participants, the findings highlighted the value of formal educational preparation in chemotherapy prior to undertaking the aspect of nursing. The result reinforced that co ordinated education and training strategy for chemotherapy practice is warranted to underpin safe and effective practice in this area.

Magda M. et.al., (2011) Widespread use of chemotherapeutic drugs in the treatment of cancer has lead to higher health hazards among employee who handle and administer such drugs, so nurses should know how to protect themselves, their patients and their work environment against toxic effects of chemotherapy. Aim of this study was carried out to examine the effect of chemotherapy safety protocol for oncology nurses on their protective measure practices. A quasi experimental research design was utilized. Setting: The study was carried out in oncology department of Menoufia university hospital and Tanta oncology treatment center. A convenience sample of forty five nurses in Tanta oncology treatment center and eighteen nurses in Menoufiya oncology department. Tools: 1. an interviewing questionnaire that covering socio demographic data, assessment of unit and nurses'

knowledge about chemotherapy. II: Observational check list to assess nurses' actual practices of handling and adminestration of chemotherapy. A base line data were assessed before implementing Chemotherapy Safety protocol, then Chemotherapy Safety protocol was implemented, and after 2 months they were assessed again. Results: reveled that 88.9% of study group I and 55.6% of study group II improved to good total knowledge scores after educating on the safety protocol, also 95.6% of study group I and 88.9% of study group II had good total practice score after educating on the safety protocol. Moreover less than half of group I (44.4%) reported that heavy workload is the most barriers for them, while the majority of group II (94.4%) had many barriers for adhering to the safety protocol such as they didn't know the protocol, the heavy work load and inadequate equipment. Conclusions: Safety protocol for Oncology Nurses seemed to have positive effect on improving nurses' knowledge and practice. Recommendation: chemotherapy safety protocol should be instituted for all oncology nurses who are working in any oncology unit and/ or center to enhance compliance, and this protocol should be done at frequent intervals.

Ms. Darshana.K. et.al., (2011) concludes that the overall rate of exposure decreases when nurses report adequate staffing and resources . This implies that nurse-patient ratios and workplace demands contribute to the problem of mishandling chemotherapy. Therefore, these results implicate the need for adequate staffing and resources as well as increased staff compliance to established practice standards in order to better protect oncology nurses. Other contributing factors identified in system failures that result in an unsafe work environment include lack

of awareness of personal and public risks of exposure, poor communication, and direct interruptions and/or distractions while preparing to administer medications.

Ashley, et.al., (2011). In this Study the structured checklist was used to see the practice regarding safety measures used by nurses while handling chemotherapy drug. Assessment of nurses practice while handling chemotherapy drug shows that Majority of samples 56 (56%) were having poor practice while handling chemotherapy drugs and 44% of nurses were having good practice while handling chemotherapy drugs, Maximum score was 6 and minimum score was 1. After the detailed analysis, this study leads to the following conclusion that assessment of nurses' practice while handling chemotherapy drug. Majority of samples were having poor practice while handling chemotherapy drugs.

Najma Khan (2012) To measure the levels of nurse's knowledge and attitude after the conduct of education session regarding chemotherapy administration and management. Methodology: This research study was conducted at two oncology units of tertiary Hospital Rawalpindi. A pre-post test intervention study design was used on 35 nurses by using Verity's tools. Results: The mean scores of knowledge were calculated by Cochran's Q test showed that knowledge scores have significantly increased with 'educational training' (p value < 0.001). The difference in the attitude of the nurses was not found to be statistically significant in repeated measure of ANOVA. The results show that knowledge is the weakest component and attitude is strongest component of oncology nurses 'competencies in chemotherapy administration.

Gibson, F., et.al., (2012) conducted a descriptive study to explore the knowledge, attitude and beliefs of nurses who administer chemotherapy to children and young people, 286 nurses were the samples of study. The study showed that nurses new to chemotherapy administration were initially anxious about their role and due to their anxious state makes drug error. Education and support from colleagues appears to have had a positive effect on reducing worry and increasing competence.

Polovich, M., & Clark, P. C., (2012) conducted a cross-sectional study, among 165 nurses who were reported handling chemotherapy in oncology centers across the United States using mailed survey method, to examine relationship among factors affecting nurses use of hazardous drugs, safe-handling precautions, identify the factors that promote over interfere with the hazardous drug precaution use and determine managers perspective on the use of hazardous drug safe handling precaution. The result showed that circumstances in the work place interfere with the nurses to use precaution during drug preparation.

Chan Huan Keat, et.al., (2013)A prospective interventional study was conducted in a General Hospital, Malaysia a single group of 96 nurses actively participated for assessing the change of nurses' safety-related knowledge as well as attitude levels regarding cytotoxic drugs. A self-administered questionnaire and performance checklist were used. The first and second assessments took 2 months respectively with a 9-month intervention period. The study result shows that the pharmacist-based interventions improved the knowledge, attitude and safe practices

of nurses in cytotoxic drug handling (7.6 ±5.51 to 15.3±2.55). It concludes that further assessment may help to confirm the sustainability of the improvement in practices.

Mc Ilfatrick, S., et.al., (2013) descriptive study tried to explore the nurse's experience on chemotherapy service in an acute general hospital in North Ireland. Face to Face focused in-depth interviews were concluded among 10 nurses. Data analysis involved a two stage approach. The study concluded that the nurses viewed their experience of the chemotherapy day hospital as having both positive and negative dimensions. The positive dimensions include an increased sense of autonomy and the challenge of developing new skills, while the negative dimension included a perceived decrease in their caring role. Role changes leads to a perceived dichotomy between their actual and aspired role and their caring and clinical role.

Verity, R., et.al., (2014) conducted a descriptive study to explore the work of nurses who administer chemotherapy. The study was conducted across 26 London hospitals providing cancer services.244 nurses were the study participants, the findings highlighted the value of formal educational preparation in chemotherapy prior to undertaking the aspect of nursing. The result reinforced that coordinated education and training strategy for chemotherapy practice is warranted to underpin safe and effective practice in this area.

Kosgeroglu, N., et.al., (2015) conducted a descriptive study among 121 Turkish nurses, to determine both the level of information that nurses possessed and

the method of administration nurses used during chemotherapeutic drug preparation and administration. Nurses showed that their actual administration method was insufficient according to their level of information. The ratio for nurse's usage of the safety cabinet during the preparation of chemotherapeutic drugs was very low at 14.2%. Only 7.4% of nurses had received in-service education about chemotherapeutics. The study revealed that the hospital should be required to provide sufficient equipment and to give this precedence in hospital policies.

Brown, C. G., et.al., (2016) conducted a prospective study to assess the value of oncology nursing certification. A total of 940 Oncology nurses participated and completed a demographic survey and the perceived value of certification tool. Most were Caucasian women. 36% were staff nurses.19% were nurse managers and 10% were advance practice nurses. A high value of certification was reported. Both certified and non-certified nurse's valued certification. Increasing institutional reorganization and financial support could improve nurses' certification rates and ultimately result in improved patient care.

Darshana Kumari (2018) In a recent study of outpatient nurses, participants reported significant unintended skin and eye exposure to chemotherapy Friese, et al. In this study, the author concludes that the overall rate of exposure decreases when nurses report adequate staffing and resources (2011). This implies that nurse-patient ratios and workplace demands contribute to the problem of mishandling chemotherapy. Therefore, these results implicate the need for adequate staffing and resources as well as increased staff compliance to established practice standards in

order to better protect oncology nurses. Other contributing factors identified in system failures that result in an unsafe work environment include lack of awareness of personal and public risks of exposure, poor communication, and direct interruptions and/or distractions while preparing to administer medications

III. STUDIES RELATED TO MANAGEMENT OF SIDE EFFECTS OF CHEMOTHERAPY

Martin, S., Larson, E., (2010) conducted a descriptive co relational study among 500 randomly selected members of the oncology nursing society who identified their work settings as office, clinic, or outpatient private practice. The aim of the study was to determine the current patterns of use of personal protective equipments among oncology nurses while handling anti-neoplastic chemotherapeutic agents in outpatient and office based settings. Findings revealed that use and availability of personal protective equipment when handling chemotherapy have increased, but medical monitoring of exposed employees are still neither widely practiced nor consistent with occupational safety and health administration guidelines.

Rizalar, S., et.al., (2012) conducted a study in Turkey, to determine the safety measures on personal and environmental protection taken by nurses during chemotherapy preparation and administration. 73 nurses were included in the study group. Data were obtained via questionnaire form. The finding showed that nurses notwithstanding the rules and regulation pertaining to chemotherapeutics. The result

clearly pointed out the importance of need for regular education programme and this study also revealed the necessity for improvement of the working environment.

Ramanand Chaudhary, Basant Kumar Karn.(2014) conducted a study more than 92% of participants reported usually wearing gloves during chemotherapy handling; 6% reported using laboratory coats as protective garments. Usual use of face and respiratory protection was less than 5%. Chemotherapy was reported to be prepared in nursing station where there are no laminar airflow hoods in 100% of work settings. None of the subjects have reportedly provided any type of medical monitoring. Use and availability of gloves have increased but personal protective equipment like protective garments, face and respiratory protective, when handling chemotherapy have decreased and medical monitoring of exposed employees still is neither widely practiced nor consistent with Occupational Safety and Health Administration (OSHA) guidelines.

Navadeep.N.(2014) A quasi experimental study was conducted to assess nursing knowledge and practice of safe handling of chemo therapy drugs innovations methods among the nurses in nursing hospitals in Kothi. The study result shows that were divided into three main types of innovation nursing education safety handling and proper handling24% advanced nursing practice,45% hospital-at-home and integrated care. The study concluded that types of innovation Advanced nursing practice is a way to meet the changing and complex care demands in nursing. In addition, advanced nursing practice is often important in achieving substitution. This study concluded that education provided by a nurse specialist

improves technique and understanding of side effects safe handling of chemotherapy drugs.

Gan, et.al., (2015) conducted a study in Japan regarding safety issues of chemo drug administration handling by nurses from an occupational exposure view point and through visualization with contrast media for ophthalmic vasculature. The result showed spills all over in the procedure by nurses in the study, specifically splash to environment around the drug preparation area, contamination of needles which were used for drug preparation, contamination of environment as a result of priming with chemo agent. So it is considered that strict conformity to chemo drug administration procedure based on authorization guidelines is very important in addition to the standard of administration procedure in each facility.

Amboto Justina .N (2017) a descriptive cross sectional study was conducted at the Windhoek Central Hospital oncology ward to assess and describe the knowledge about side-effects of chemotherapy among adult male and female patients with leukemia and to determine if nurses provide health education to patients. The data were collected from 21 participants representing a 91% response rate of the study population. The indicated that the most known side-effects were the loss of hair (48%) and vomiting (38%). Although a significant percentage (62%) of patients knew about the side-effects of chemotherapy, 60% of the patients received their information from the physicians. The study therefore concluded that nurses at oncology wards seem not being proactive to provide health information to patients.

Recommendations were made for the nurses to increase their participation in providing health education to patients.

P Latha and Dr. S Indira (2017) Cancer is treated by many therapies such as radiation therapy, chemotherapy, surgery and hormonal therapy, each may be used along or in combination with other modalities. Chemotherapy is a major treatment modality for cancer, currently chemotherapy was responsible for increasing the survival time of many patients with cancer. A quantitative approach A quantitative approach with descriptive design, Sample size was 30; out of which, 15 staff nurses and 15 nursing students were selected by using Non-probability convenience sampling technique. Study revealed that the level of knowledge among staff nurses, 9(60%) had inadequate knowledge, 4 (27%) had moderate knowledge and 2(13%) had adequate knowledge. Among nursing students, 13(87%) had inadequate knowledge, 2(13%) had moderate knowledge and none of them had adequate knowledge regarding chemotherapy. The study concluded that staff nurses had better knowledge than nursing students on Care of Patients with Chemotherapy.

Thao K Huynh, PharmD (2018) conducted a descriptive study of the 92 surveys distributed, 67 were returned for analysis. The majority of patients (91%) responded that they had a good understanding of the chemotherapy regimen they were receiving, but only 52.2% of patients were able to list the specific chemotherapy agents. Similar results were seen from patients regarding their understanding of pre medications. Patients treated at the community hospital infusion centre were more confident in knowing which chemotherapy side effects to

expect at home and were able to list chemotherapy-related adverse effects in correlation to a greater extent than patients at the larger teaching hospital infusion centre. Patients with cancer at the community hospital had an oncology pharmacist present at least 2 days per week, which increased patient comfort in consulting with a pharmacist for chemotherapy-related adverse effect management. The results of this study will help increase the awareness of the gaps that exist in patients' knowledge and management of chemotherapy-related adverse effects. The results also highlight opportunities for oncology pharmacists to provide patient education as well as ongoing monitoring and management of adverse effects.

CHAPTER – III

RESEARCH METHODOLOGY

Research may be defined as systematic and objective analysis and recording of controlled observations that may lead to development of organizations, principles & possibility ultimate control of events. **(John W.Best, 2002)**

Research in any organization is the inquiry carried out to provide information for solving problem. **(Cooper & Schindler, 2003)**

This chapter gives a brief description of the methods adopted by the investigator to assess the effectiveness of safe handling and administration of chemotherapeutic drugs among staff nurses. It deals with research approach, research design, study setting, population and criteria for selection of sample, sampling techniques, sample size, development of the tool, content validity, pilot study, reliability, feasibility. procedure of data collection and statistical analysis Research approach.

RESEARCH APPROACH

Evaluative result is an extremely applied form of research and involved in finding out how well a policy is working its goal is it, assess or evaluate research is generally applied where the primary objective is to determine the extent to which a given treatment with a goal needs the desired results. **(Polit and Hunger, 2012)**

Research approach adopted for this study was an quantitative evaluative approach. An evaluative approach helps to explain the effects independent variables on the dependent variable.

This research approach is considered by the investigator as the most suitable one for the study.

RESEARCH DESIGN

It as a plan for selecting subjects, research sites, and data collection procedures to answer the research question(s). They further indicate that the goal of a sound research design is to provide results that are judged to be credible. **(MacMillan and Schumacher, 2001)**

In view of the nature of the problem ,and to accomplish the objectives of the study, accessing the pre-existing level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses. **Pre-experimental one group pre test-post test** design was selected for the study.

The design to be used is depicted as follows:

Schematic presentation of research design

Research Design	O_1	X	O_2

O_1 - Pre test to assess the level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

X - Structured teaching program on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses in selected hospital.

O_2 - Post test to assess the effectiveness of structured teaching program on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

SETTING OF THE STUDY

The study setting is the location in which the research is conducted. It could be natural, partially controlled, or highly controlled. The selection of setting is based on the feasibility, availability of subjects and geographical proximit. **(Suresh K Sharma, 2013)**

The study was conducted among nurses posted in oncology unit, SIMS Hospitals, Chennai. SIMS hospital has a bed strength of 350 and it is a multi-specialty hospital where the annual inpatient census for oncology is around, similarly 156 inpatients were admitted per month and 3to 4 inpatients per day. Patients were admitted on different wards like medical oncology, delux and single room. Medical oncology ward consists of 22 beds with proper ventilation facilities, refrigerator for storing chemotherapy drugs, designated area for preparing drugs and washing area for disinfecting.

VARIABLES

Variables are the levels of abstraction that are measured manipulated or controlled in a study. (**Nancy Burns and Susan K Grove)**

Independent variable

The condition that is intentionally changed by the investigator in an experiment. There can be only one independent variable in an experiment. (**Shaker, 2011)**

The independent variable within this study refer to **the structured teaching programme** on safe handling and administration of chemotherapeutic drugs which was used to help the nurses to increase their knowledge about chemotherapy.

Dependent variable

The factors or conditions that will change as a result of the independent variable. The factors that you measure or observe as data. There can be one or more dependent variables in an experiment. (**Shaker, 2011)**

The dependent variable of the study refer to **knowledge of the staff nurses** on safe handling and chemotherapy administration.

POPULATION

Population refers to the entire set of individual or objects having some common characteristics. **(Shivani Sharma, 2011)**

Target population

Target population consists of the total no of people or objects which are meeting designed set of criteria. **(Suresh K Sharma, 2012)**

The population of this study will be staff nurses.

Accessible population

It is an aggregate of the cases that confirm the design criteria and are also accessible as subject for the study. **(Suresk K Sharma, 2012)**

The accessible population for this study was the among staff nurses in selected hospital in Chennai, who meets the inclusion criteria. Knowledge regarding safe handling and administration of chemotherapeutic drugs.

SAMPLE

Sample is a small portion of the population selected for a particular study and members of the sample are study objects.

The sample selected for the present study were the knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses in SIMS hospital, Chennai.

SAMPLE SIZE

In this study 30 nurses will be selected from a hospital.

SAMPLING TECHNIQUE

Sampling technique is the procedure that the researcher adopts in selecting the samples for the study. **(Suresh K Sharma, 2010)**

Purposive sampling technique was used to select the sample for this study.

CRITERIA FOR SELECTION OF THE SAMPLE

Inclusion Criteria

Inclusion criteria are characteristic that each sample element must possess to be included in the sample.

- Staff nurses who are posted in medical oncology department

- Staff nurses who have completed three years of diploma in general nursing and Midwife programme, B.Sc,(N), M.Sc., (N)

- Nurses who are willing to participate in the study

- Nurses who are present at the time of data collection.

Exclusion Criteria

Exclusion criteria are characteristic that could confound or contaminate the results of the study therefore such participants are excluded from the study.

- Nurses who are not present at the time of data collection.

- Nurses who are sick

DEVELOPMENT OF TOOL

Tool is an act as an instrument to assess and collect the data from the responded of the study. **(Polit and Hunger, 2004)**

The investigator prepared and developed a closed ended multiple choice questionnaire on knowledge regarding safe handling and administration of chemotherapeutic drug as tool. In present study after exploring all sources of information like extensive library, internet sources and consultation with experts.

INSTRUMENT FOR DATA COLLECTION

The scholar constructed the instrument based on the objective of the study through literature review and experts guidance.

There are two section of tools were used. They are,

Section I: Demographic Variables

- Age
- Gender
- Religion
- Educational status
- Years of experiences
- Any additional training

Section -II: Questionnaire for assessment tool

This section deals with questionnaire for assessment of knowledge regarding safe handling and administration of chemotherapeutic drug. It consists of 30 multiple choice questions related to knowledge regarding safe handling and administration of chemotherapeutic drug among staff nurses. Each correct answer will be given the score of one and the wrong answer will be given the score of zero. The total possible score will be 30.

Interpretation of score:

The level of knowledge was interpreted as follows:

Level of knowledge	Score	Percentage
Adequate knowledge	21-30	(67-100%)
Moderate knowledge	11-20	(34-66%)
Inadequate knowledge	0-10	(34-66%)

VALIDITY

Validity refers to how well attest measure what it is purported to measure. (**Polit and Hunger, 2010**)

The tool was prepared by the investigator based on literature view, under the guidance of experts and on the basis of objectives, which were assessed and evaluated, accepted by the experts of research committee. The content validity of the tool was obtained from research experts from the field of medical surgical nursing.

The validity of the tool has been determined by expert opinion from different fields along with the objectives of the study. The experts were requested to give their opinion, clarity and appropriateness, suggestions for the modification of the tool and were incorporated in the final tool. The tool which was used for the study was structured questionnaires, the reliability and the practicability of the tool was tested through pilot study.

RELIABILITY

Reliability is a degree to which assessment of tool produces stable and consistent results. (**Polit and Hunger, 2010**)

The reliability of structured questionnaire was tested by implementing the tool on 5 staff nurses ,which is other than the sample area. Split half method (spearman brown formula) was used to test the reliability of the tool (**r^1=0.84 and r^1=0.88**)

PILOT STUDY

Pilot study is a trail study carry out before a research design is finalized to assist in defining the research question or to test the feasibility, reliability, and validity of the proposed study design. **(Sayadwad, 2016)**

A pilot study is a small study designed to gather information prior to a larger study, in order to improve the quality of final study. A pilot study can reveal deficiencies in the design of a proposed research proposal. **(Yogesh ingle**, **2014)**

For trial run, pilot study was conducted in the oncology unit for one week (March 2018) to test the feasibility of the study, on a conveniently selected sample of 5 staff nurses.

DATA COLLECTION PROCEDURE

Data is the piece of information obtained in the study. Data collection is the gathering of information needed to address the research problem. (**Suresh K Sharma, 2010)**

Data collection is the precise, systematic gathering of information relevant to the research sub problems using methods such as interviews, participant observation, focus group, discussion. **(Burns & Groves, 2005)**

The main study was conducted at SIMS Hospitals Chennai. The investigator introduced her to the staff nurses and developed a good rapport and made them to cooperate and accept for the study. After getting demographic data from the staff nurses, pre test was done with the help of the prepared tool. After the pre test, structured teaching programme on knowledge regarding safe handling and administration of chemotherapeutic drugs was shown to the staff nurses by using knowledge questionnaire. Seven days after the post-tests were done to evaluate the effectiveness of structured teaching programme on knowledge regarding safe handling and administration of chemotherapeutic drugs by using same evaluation tools. Based on the collection data, effectiveness was found by comparing the pre-test and post-test score.

PLAN FOR DATA ANALYSIS

Data analysis is the systematic organization and synthesis of research data, and the testing of research hypothesis using those data. The data obtained was analyzed using descriptive and inferential statistics such as paired' t' test to compare the mean pre test and post test over all knowledge, all the department of staff nurse assessed knowledge score. Chi square was used to find the association between post test knowledge score with demographic variables.

DATA COLLECTION METHOD

Prior to data collection permission will be obtained from hospital authority concerned for conducting the study.

DATA ANALYSIS PLAN

- To assess the level of knowledge among staff nurses before and after structured teaching programme is analyzed by using **frequency and percentage**.

- To find the effectiveness of structured teaching programme regarding knowledge on safe handling and administration of chemotherapeutic drugs among staff nurses analyzed by **mean and standard deviation, mean percentage and paired' t 'test.**

- To find the association between post scores of knowledge among staff nurses with their demographic variables is analyzed by **Chi-square test.**

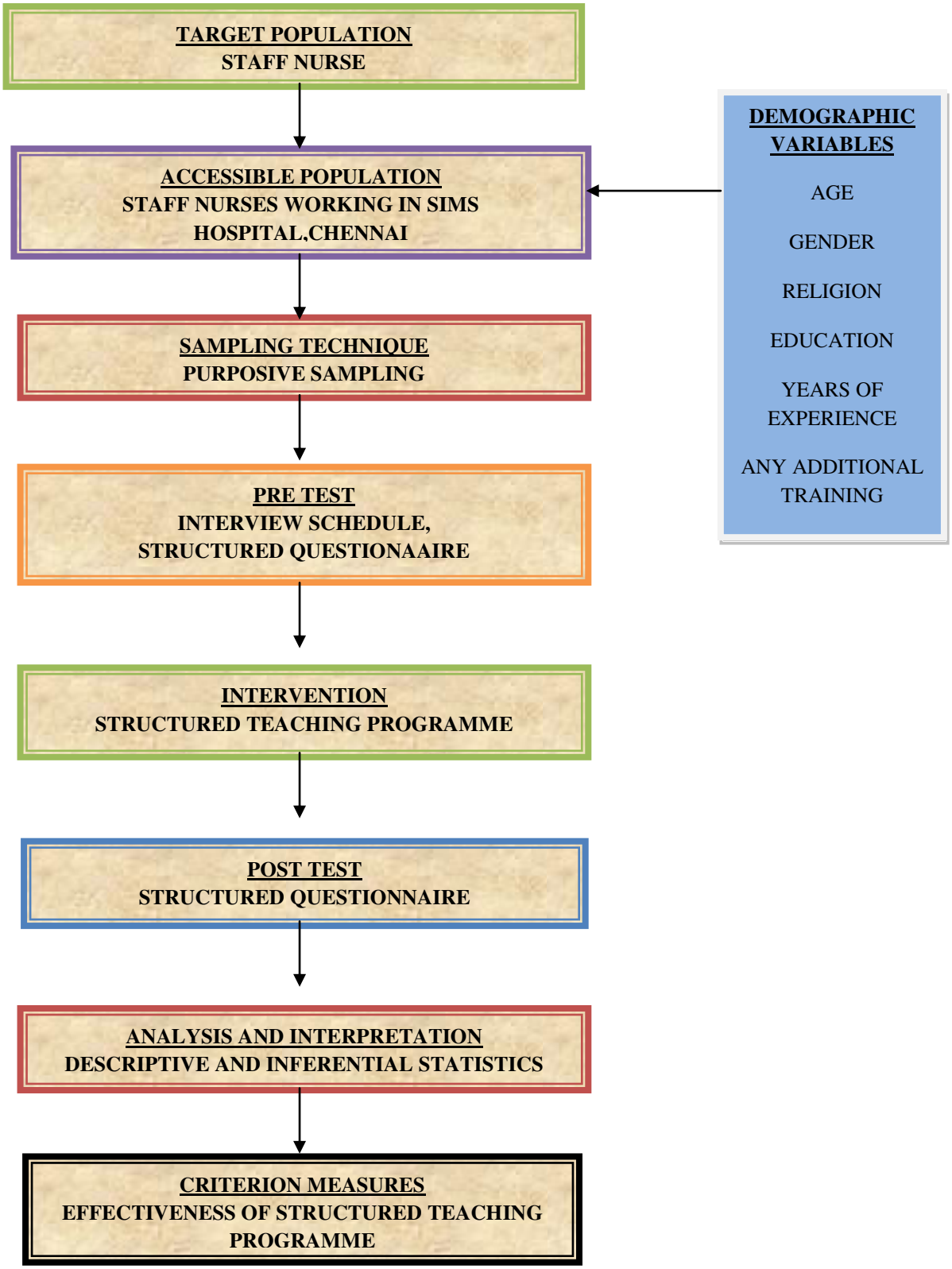

FIG 3.1 SCEMATIC REPRESENTATION OF RESEARCH METHODOLOGY

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Analysis is a process of organizing the data in such a way that research question can be answered **(Polit and Hungler, 1999)**. Data analysis is a systematic process where the investigation transforms the data collected into numerical form by applying statistical techniques to illustrate, condense, recap and evaluate data. Data interpretation, a critical thinking skill refers to the process of determining and critiquing the significance of the survey results and finding.

This chapter deals with the analysis of data collected pre-experimental study to assess the effectiveness of structured teaching program regarding safe handling and administration of chemotherapeutic drugs among staff nurses in SIMS hospital, Chennai.

Descriptive and inferential statistics were used for analysis of data. The collected data were organized as follows:

- To assess the level of knowledge regarding safe handling and administration of chemotherapeutic drugs before and after structured teaching programme.

- To evaluate the effectiveness of structured teaching programme regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

- To find out the association between post test knowledge level regarding safe handling and administration of chemotherapeutic drugs among staff nurses with their selected demographic variables.

The data analyzed were presented as follows:

Section I: Description of samples according to their demographic variables..

Section II: Assess the level of knowledge among staff nurses before and after structured teaching programme on safe handling and administration of chemotherapeutic drugs.

- ❖ Frequency and percentage distribution of pre and post test scores on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

- ❖ Paired "t" test value of pre and post score of knowledge.

- ❖ Mean and standard deviation and mean percentage of pre and post test knowledge scores on safe handling and administration of chemotherapeutic drugs among staff nurses.

Section III: Data on association between the post test scores on level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses with their demographic variables.

SECTION – I: DESCRIPTION OF SAMPLES ACCORDING TO THEIR DEMOGRAPHIC VARIABLES

Table- 4.1: Frequency and percentage distribution of demographic variables among staff nurses.

(n = 30)

S. No.	Demographic Profiles		Number	Percentage (%)
1	Gender	Male	4	13.3%
		Female	26	86.7%
2	Age	21 - 25 Yrs	13	43.3%
		26 - 30 Yrs	15	50%
		> 30 Yrs	2	6.7%
3	Religion	Hindu	15	50%
		Christian	13	43.3%
		Muslim	2	6.7%
4	Year Of Experience	< 2 Years	11	36.7%
		2 – 3 Years	5	16.7%
		> 3 Years	14	46.7%
5	Educational Level	GNM	9	30%
		B.SC	20	66.7%
		M.SC	1	3.3%
6	Additional Training	Yes	6	20%
		No	24	80%

Table 4.1 depicts the frequency and the percentage distribution of the demographic variables such as age, gender religion, year of experience, education level, additional training of staff nurses out of 30 staffs.

Distribution of sample according to their **Age**, majority of the staff nurses were in the age group of 26 - 30 Years were 15 (50.0%) and least were above 30 Years were 2 (6.7%).

Distribution of sample according to their **Gender**, majority of the staff nurses were Female was 26 (86.7%) and least were Male 4 (13.3%).

Distribution of sample according to their **Religion,** majority of staff nurses was belonging to Hindu 15 (50.00%) and least was Muslim were 2 (6.7%).

Distribution of sample according to their Year of **experience**, majority of staff nurses were having experience above 3 Years which was 14 (46.7%), and least were 2-3 Years which was 5 (16.7%).

Distributions of sample according to their **Education Level**, majority of the staff nurses have done their B.Sc which were 20 (66.7%) and least was M.Sc were 1 (3.3%).

Distributions of sample according to their **Additional training** majority of staff nurses who have additional training were 6 (20.0%) and least was 24 (80.0%).

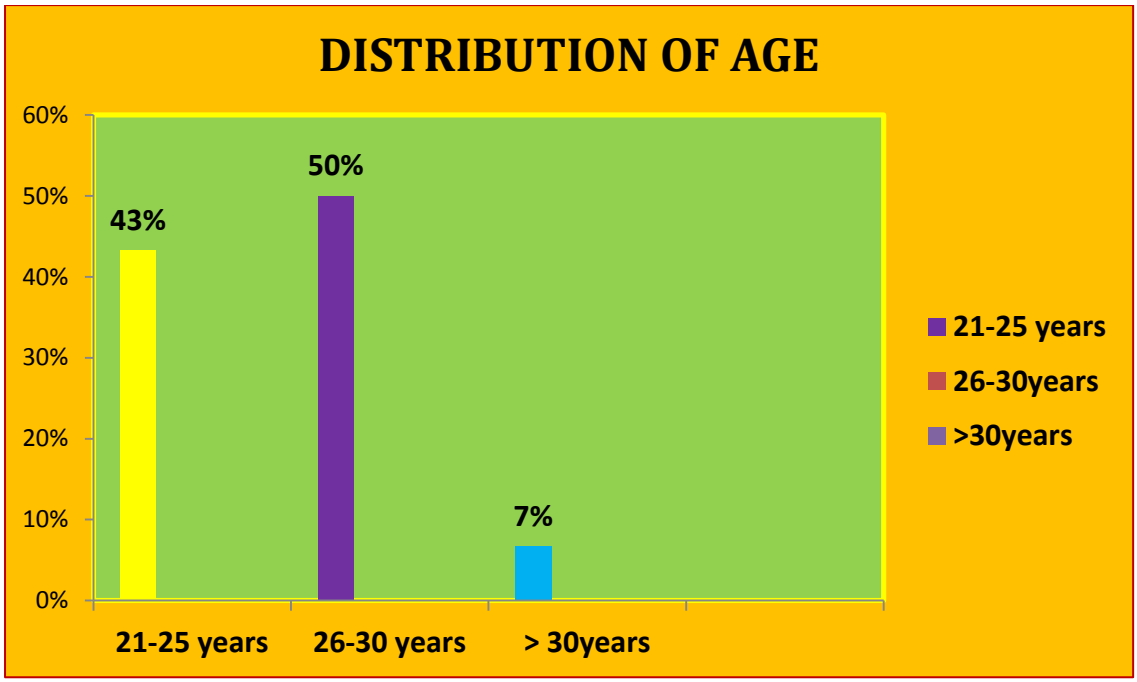

Fig. 4.1: Bar diagram showing frequency and percentage distribution of staff nurses regarding age

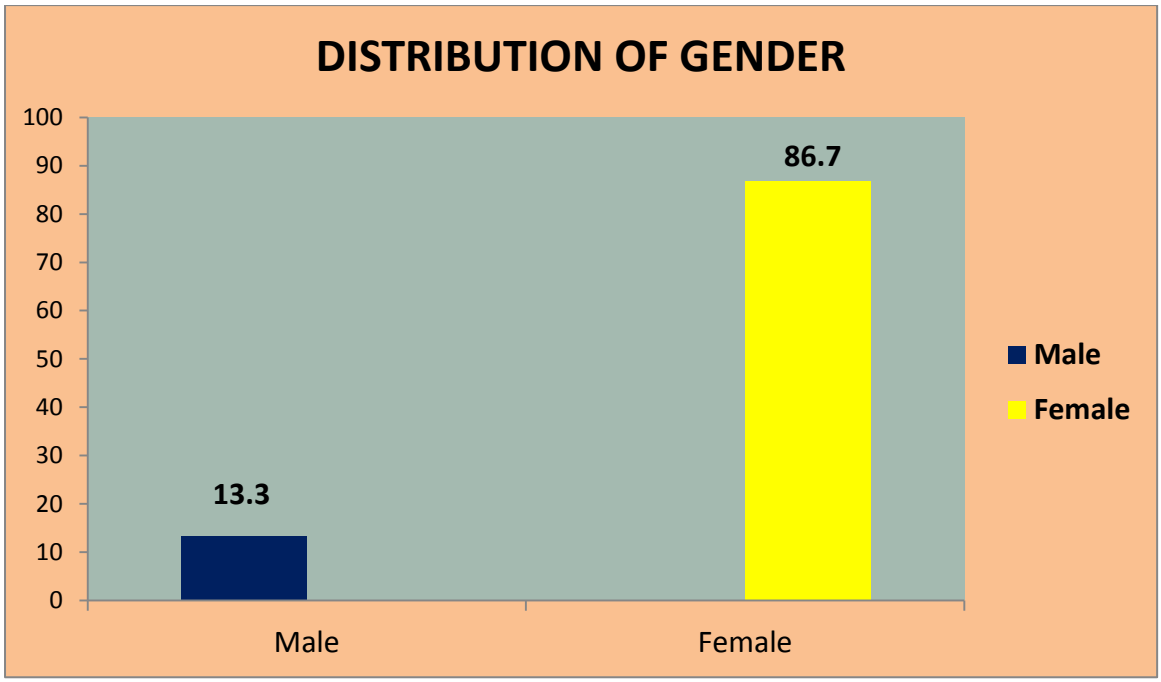

Fig. 4.2: Bar diagram showing frequency and percentage distribution of staff nurses regarding gender

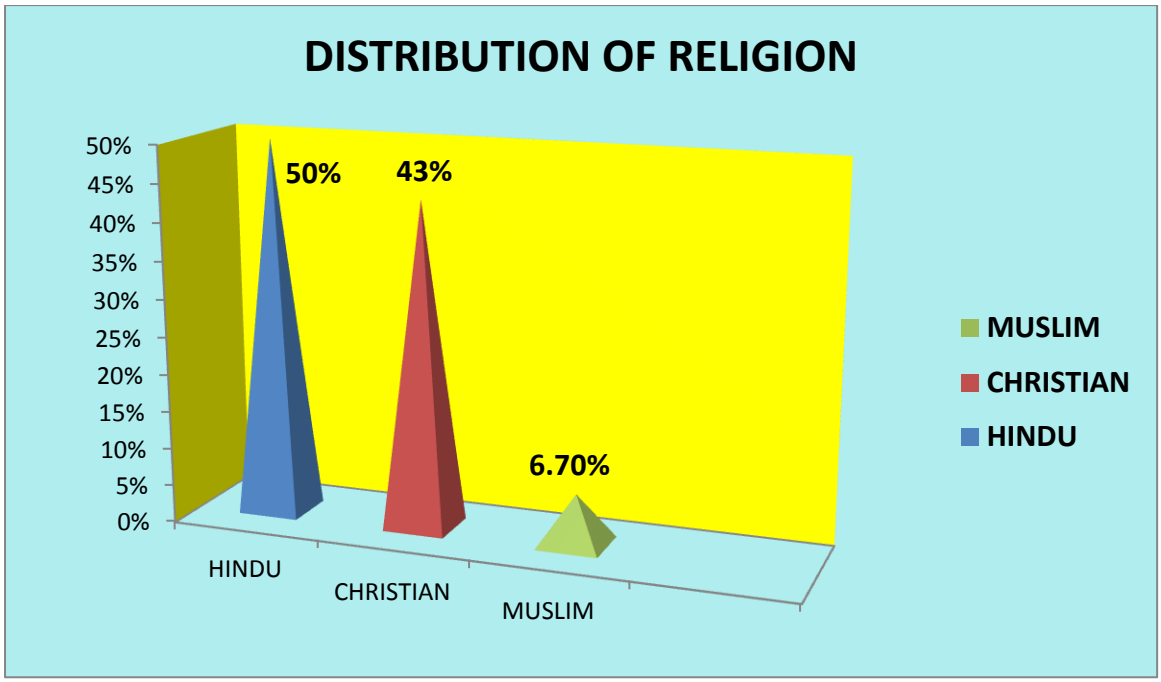

Fig. 4.3: Cone diagram showing frequency and percentage distribution of staff nurses regarding religion.

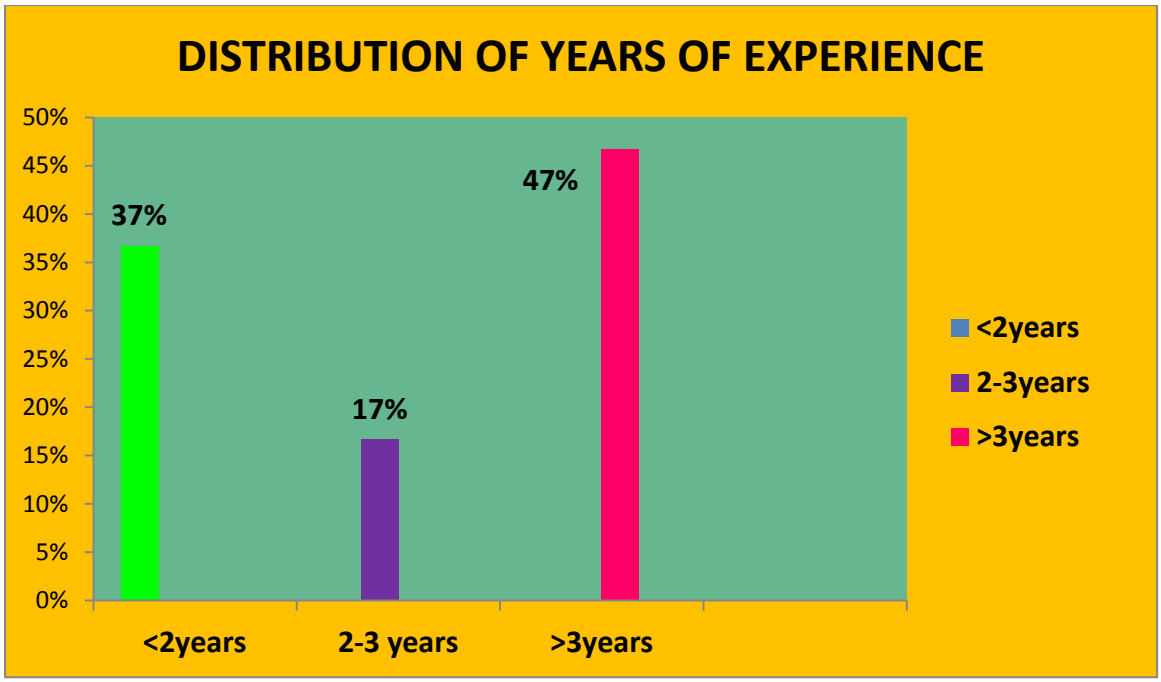

Fig. 4.4: Bar diagram showing frequency and percentage distribution of staff nurses regarding years of experience.

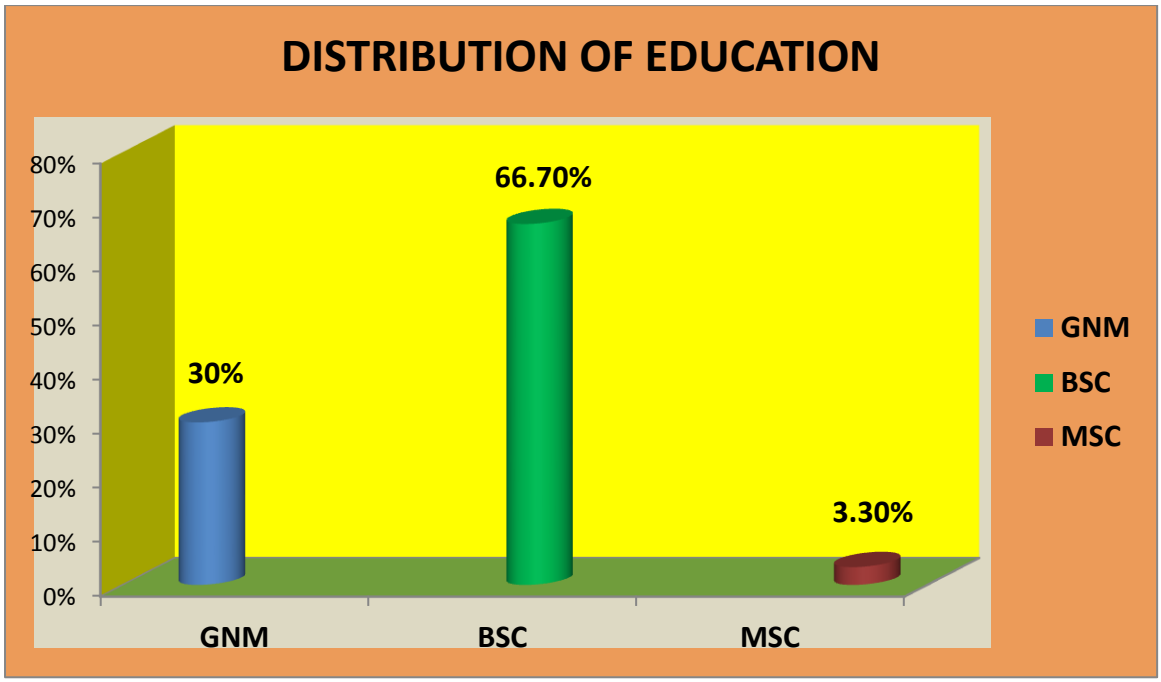

Fig. 4.5: Cylinder diagram showing frequency and percentage distribution of staff nurses regarding their professional education

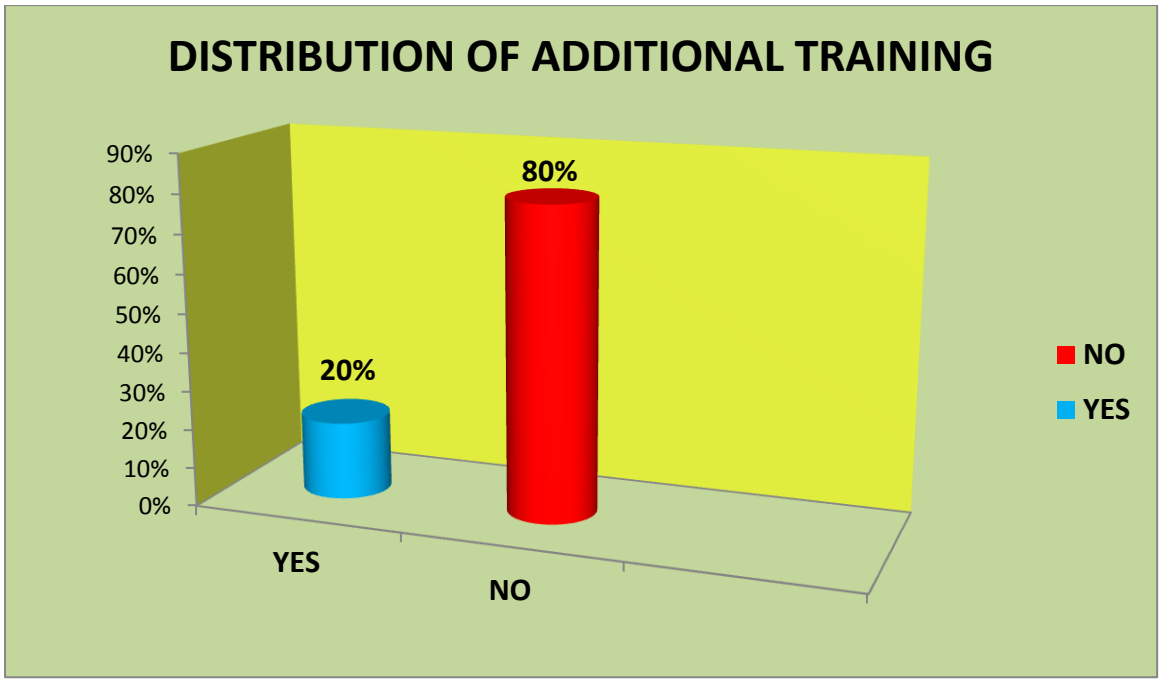

Fig. 4.6: Cylinder diagram showing frequency and percentage distribution of staff nurses regarding their additional training.

SECTION – II: ASSESS THE LEVEL OF KNOWLEDGE AMONG STAFF NURSES BEFORE AND AFTER STRUCTURED TEACHING PROGRAMME ON SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS

Table 4.2: Frequency and percentage distribution of pre and post scores on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

S. No.	Level of knowledge	Marks	Pre Test		Post Test	
			F	%	F	%
1	Adequate knowledge	30	1	3.3	29	93.3
2	Moderate knowledge		13	43.4	1	6.7
3	Inadequate knowledge		16	53.3	0	0
			N=30	100	N=30	100

Table 4.2 shows that the knowledge regarding safe handling and administration of chemotherapeutic drugs through the pre-test and post-test based on the questionnaire method. In the Pre-test among 30 Staff nurses Adequate 1 (3.3%), Moderate Adequate 13 (43.3%), Inadequate Knowledge 16 (53.3%). In the Post-test among 30 staff nurses Adequate 29 (93.3%), Moderate Adequate 1 (6.76%), Inadequate Knowledge 0 (0%). It seems that structured teaching programme among staff nurses was more effective.

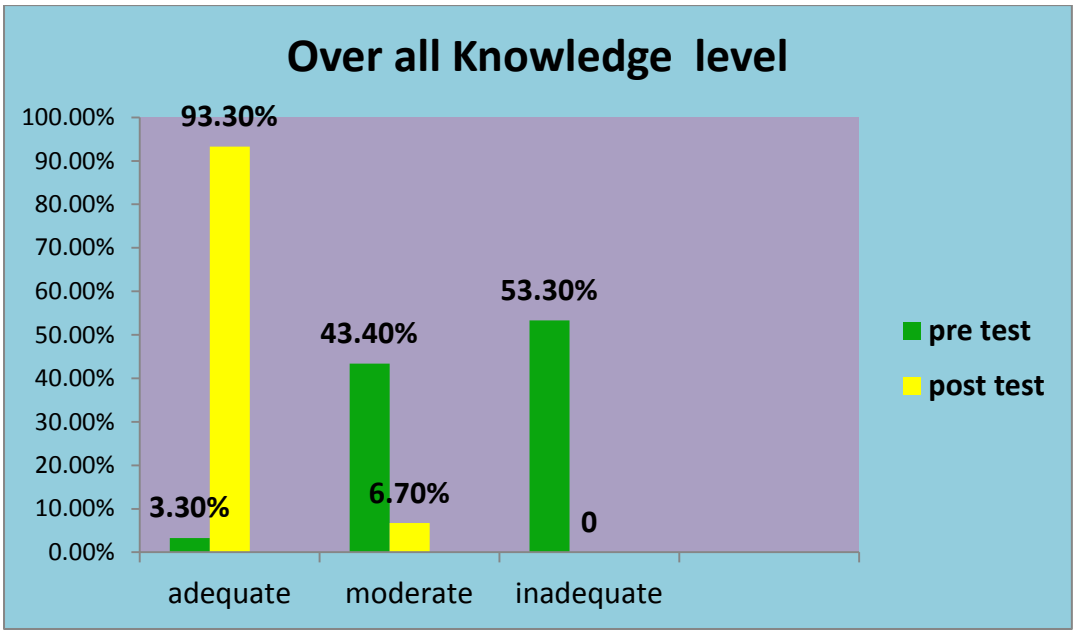

Fig. 4.7: Bar diagram indicates the distribution of staff nurses by pre test and post test overall level of knowledge.

TABLE – 4.3: Comparison between mean and standard deviation of pre test and post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

(n = 30)

S.No.	Level of Knowledge	Mean	Mean %	SD	Mean Difference	t value	Table Value	P value
1.	Pre Test	10.73	35.76	3.3107	14.77	42.3	2.00	P < 0.05
2.	Post Test	25.50	85	3.1155				

Table 4.3 shows that the overall mean of pre test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was 10.73 and SD = 3.3107, post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was 25.50 and SD = 3.1155. The paired t value 42.3 shows that there is significant difference between pre test and post test knowledge score. Mean percentage difference between pre test and post test is 14.77, which shows that the post test knowledge is higher than the pre test knowledge. It shows that structured teaching programme on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was more effective, to improve the knowledge among staff nurses in SIMS Hospitals, Chennai.

TABLE 4.4 Paired " t" test value of pre and post test scores of staff nurses.

S No.	Levels	Paired 't ' test value	Table value	Level of significance	Degree of freedom
1	**Knowledge**	42.3	9	P<0.005 significant	DF=29

Paired 't' test was calculated to analyze the effectiveness between pre and post scores of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses. The paired' t' test value in knowledge was 42.3 respectively when compared to table value (9) are high. This shows that there is a significant effectiveness between pre and post scores of level of knowledge among staff nurses, it seems that structured teaching programme on safe handling and administration of chemotherapeutic drugs among staff nurses was more effective.

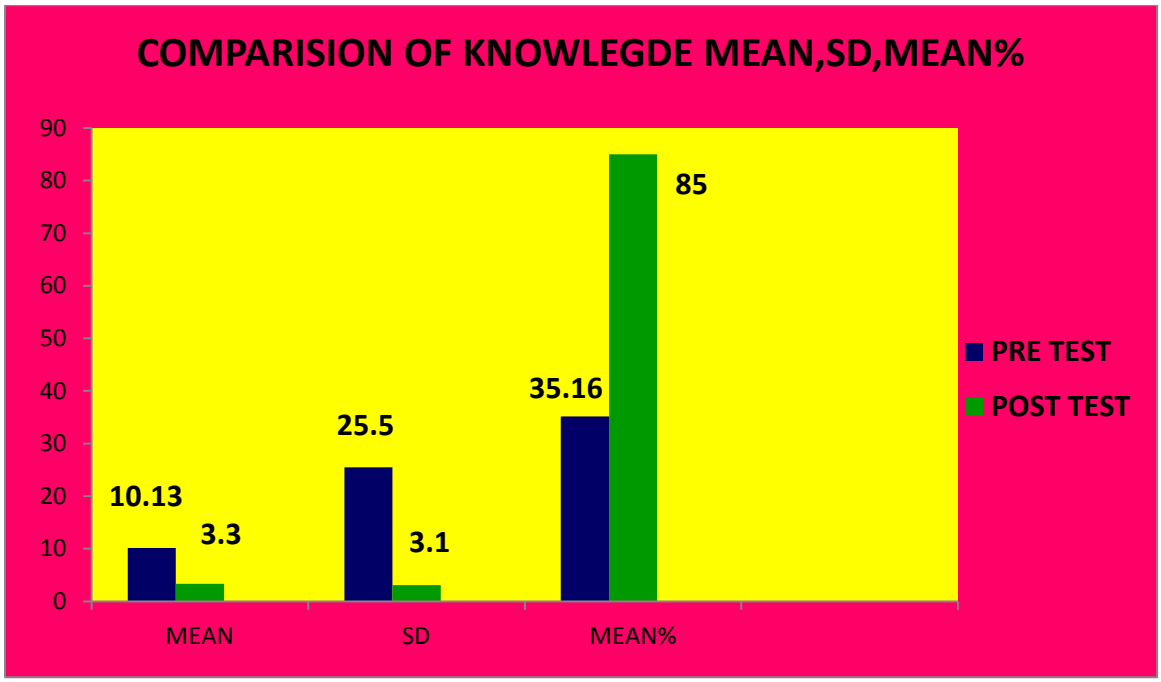

Fig. 4.8 : Bar diagram showing Comparison between mean and standard deviation and mean% of pre test and post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

SECTION - III: DATA ON ASSOCIATION BETWEEN THE POST TEST SCORES ON LEVEL OF KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES WITH THEIR DEMOGRAPHIC VARIABLES.

TABLE – 4.5: Analyzing the association between demographic variables and post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

(n = 30)

Demographic data	Post Test Knowledge Score			Chi square	P Value	Df	Table value
	Inadequate	Moderate	Adequate				
	0-10	11-20	21-30				
Age							
a) <21-25 years	0	2	9	4.59	P >0.05	4	9.49
b) 26-30 years	0	6	5				
c) >30years	0	5	3				
Gender							
a) Male	0	0	4	03.54	P > 0.05	2	5.99
b) Female	0	13	13				
Religion							
a) Hindu	0	2	5	9.723	P <0.05	4	9.49
b) Christian	0	3	10				
c) Muslim	0	2	8				
Years of experience							
a) <2years	0	7	6	1.567	P >0.05	4	9.49
b) 2-3years	0	6	10				
c) >3years	0	0	1				
Education							
GNM	0	6	7	1.47	P >10.05	4	9.49
BSC		1	2				
MSC	0	4	10				
Additional training							
a) Yes	0	9	15	1.66	P < 0.05	2	5.99
b) No	0	4	2				

Table 4.5 shows that the demographic variables of age, gender, education level, years of experience, additional training regarding safe handling and administration of chemotherapeutic drugs had not significant association with their post test knowledge and religion is significant associated with their post test knowledge.

CHAPTER – V

DISCUSSION

This data deals with the discussion based on the findings obtained from the statistical analysis and its relation to the objectives of the study, the conceptual frame work and the related literature.

This study was done to assess the Effectiveness of structured teaching on Knowledge regarding safe handling and management of chemotherapeutic drugs among Staff Nurses in SIMS Hospital, Chennai

Data collection and analysis were carried out based on the objectives of the study.

OBJECTIVE OF THE STUDY

- To assess the level of knowledge on safe handling of chemotherapeutic drugs, before and after the administration of structured teaching programme.
- To evaluate the effectiveness of structured teaching programme regarding safe handling and administration of chemotherapeutic drugs among staff nurses.
- To determine the association between the post test knowledge scores on safe handling and administrating of chemotherapeutic drugs with their selected socio demographic variables

Objective 1: To assess the level of knowledge on safe handling of chemotherapeutic drugs, before and after the administration of structured teaching programme.

(a) Frequency and percentage distribution of staff nurse in selected area regarding their demographic factors.

- The frequency and the percentage distribution of the demographic variables such as age, gender religion, year of experience, education level, additional training of staff nurses out of 30 staffs.

- Distribution of sample according to their **Age**, majority of the staff nurses were in the age group of 26- 30 Years were 15 (50.0%) and least were above 30 Years were 2 (6.7%).

- Distribution of sample according to their **Gender**, majority of the staff nurses were Female was 26 (86.7%) and least were Male 4 (13.3%).

- Distribution of sample according to their **Religion,** majority of staff nurses was belonging to Hindu 15 (50.00%) and least was Muslim were 2 (6.7%).

- Distribution of sample according to their Year of **experience**, majority of staff nurses were having experience above 3 Years which was 14 (46.7%), and least were 2-3 Years which was 5 (16.7%).

- Distributions of sample according to their **Education Level**, majority of the staff nurses have done their B.Sc which were 20 (66.7%) and least was M.Sc were 1 (3.3%).

- Distributions of sample according to their **Additional training** majority of staff nurses who have additional training were 6 (20.0%) and least was 24 (80.0%).

Section II: Data on pre test and post test scores on level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses in SIMS hospital.

(a) Frequency and percentage of pre test and post test scores on levels of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

- The knowledge regarding safe handling and administration of chemotherapeutic drugs through the pre-test and post-test based on the questionnaire method. In the Pre-test among 30 Staff nurses Adequate 1 (3.3%), Moderate Adequate 13 (43.3%), Inadequate Knowledge 16 (53.3%). In the Post-test among 30 staff nurses Adequate 29 (93.3%), Moderate Adequate 1 (6.6%), Inadequate Knowledge 0 (0%). It seems that structured teaching programme among staff nurses was more effective.

(b) Mean, standard deviation (SD) and "t" value on pre test and post test scores on level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses

- That the overall mean of pre test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was 10.73 and SD = 3.3107, post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was 25.50 and SD = 3.1155. The paired t value 42.3 shows that there is significant difference between pre test and post test knowledge score. Mean percentage difference between pre test and post test is 14.77, which shows that the post test knowledge is higher than the pre test knowledge. It shows that structured teaching programme on knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses was more effective, to improve the knowledge among staff nurses in SIMS Hospitals, Chennai

Objective 3: To find the effectiveness between post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses with selected demographic variables.

- The demographic variables of age, gender, education level, years of experience, additional training regarding safe handling and administration of chemotherapeutic drugs had not significant association with their post test knowledge and religion is significant associated with their post test knowledge.

CHAPTER – VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

The essence of any research project is based on study findings, limitations, interpretation of the result and recommendations that in-corporate the study implications. It also gives meaning to the results obtained in this study.

SUMMARY

The prime aim of the study was to evaluate the Effectiveness of structured teaching programme on Knowledge regarding safe handling and administration of chemotherapeutic drugs among Staff Nurses in SIMS Hospital, Chennai.

The objectives of the study were,

- To assess the level of knowledge on safe handling of chemotherapeutic drugs, before and after the administration of structured teaching programme.

- To evaluate the effectiveness of structured teaching programme regarding safe handling and administration of chemotherapeutic drugs among staff nurses.

- To determine the association between the test knowledge scores on safe handling and administrating of chemotherapeutic drugs with their selected socio demographic variables.

The study attempted to examine the following research hypothesis:

H_1 : There will be significant difference between the pre-test and post –test knowledge scores.

H_2 : There will be significant association between the level of knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses and their selected socio demographic variables.

The review of literature enabled the investigator to develop conceptual framework, tool and methodology for the study. Literature review was done as follows: Studies related to incidence and prevalence of Dengue Hemorrhagic fever, signs and symptoms and management of Dengue Hemorrhagic fever**,** effectiveness of Dengue Hemorrhagic fever

The conceptual framework adopted for the present study was based on Widenbach Theory. This model helped the investigator to assess the structured teaching programme on Knowledge regarding safe handling and administration of chemotherapeutic drugs among Staff Nurses in selected Hospital.

The present study was pre-experimental, with one group pre-test and post-test group design. Independent variable in this study is knowledge regarding safe handling and administration of chemotherapeutic drugs and dependent variable is structured teaching, and associate variable for this study were socio-demographic.

The tool developed and reused for the data collection was on knowledge based structured questionnaire. A multiple choice questionnaire was used regarding safe handling and administration of chemotherapeutic drugs. The content validity of the tool was established by 5 experts. The reliability of the tool for knowledge (r=0.93). The tool was found to be reliable.

The pilot study was conducted staff nurse in SIMS hospital, Chennai, the study was found to be feasible.

The main study was conducted nurse in SIMS hospital, Chennai. Prior permission from the authorities was sought and obtained. Individual informed consent was taken from study sample. The study sample was selected by sampling method based on sample selection criteria.

A total of 30 staff nurse from hospital were selected. First pre-test were collected from the subjects regarding knowledge safe handling and administration of chemotherapeutic drugs and followed by the structured teaching o safe handling and administration of chemotherapeutic drugs were conducted for 50 minutes. Post test was measured after the teaching programme. The collected data were analysed and interpreted based at 0.05 level of significance.

CHARACTERISTICS OF STUDY SAMPLES

The frequency and the percentage distribution of the demographic variables such as age, gender religion, year of experience, education level, additional training of staff nurses out of 30 staffs.

- Distribution of sample according to their **Age**, majority of the staff nurses were in the age group of 26- 30 Years were 15 (50.0%) and least were above 30 Years were 2 (6.7%).

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Objective 3: To find the effectiveness between post test knowledge regarding safe handling and administration of chemotherapeutic drugs among staff nurses with selected demographic variables.

- The demographic variables of age, gender, education level, years of experience, additional training regarding safe handling and administration of chemotherapeutic drugs had not significant association with their post test knowledge and religion is significant associated with their post test knowledge.

IMPLICATIONS

The findings of the study have the following implication in nursing.

Nursing Implications

- The finding of the study have implication in different branches of nursing that is nursing practice, nursing education, nursing administration and nursing research by assessing a level of staff nurses knowledge towards the

safe handling and administration of chemotherapeutic drug. The investigator received a clear picture regarding the different steps to be taken in different field to improve the same.

Implication for Nursing Practice

- The nurse and other health professionals should be aware of safe handling and administration of chemotherapeutic drug. The purpose is to maintain, improve and promote the health of every staff nurses. The program also includes planning the course content rules of safety related to safe handling and administration of chemotherapeutic drug among staff nurses.

- The teaching given and it showed that there was an increase in the knowledge of staff nurses regarding safe handling and administration of chemotherapeutic drug.

Implication for Nursing Education

- The study outlines, the significance of short term courses and in-service education to equip nurses with the current knowledge on safe handling and administration of chemotherapeutic drug among staff nurses.

- Nurse educators when planning and instructing nursing students, should provide opportunities gain the knowledge in teaching in safe handling and administration of chemotherapeutic drug.

- Nursing personnel should be given in-service education to update their knowledge.

- Nurse educators when instructing, should provide adequate opportunity for each staff nurses.

Implication for Nursing Administration

- With technology advanced and ever growing challenges of health care needs. The college and hospital administration, have a responsibility to provide nurse educators with continuing education opportunities on safe handling and administration of chemotherapeutic drug. This will enable the nurses to update their knowledge and to acquire special skills.
- The study finding will help the administrators to arrange continuing education programme for nurses regarding safe handling and administration of chemotherapeutic drug. It helps to prepare adequate learning material for giving health education.
- The nurse administrator should take active part in the policy making, developing protocol, standing orders related health education. An educational programme on safe handling and administration of chemotherapeutic drug need adequate supervision by nursing administrator and motives them to carry out educative roles.

Implication for Nursing Research

- There is a need for intensive and extensive research in this area. It opens a big avenue for research on innovative methods of creating awareness, development of teaching material and setting up multimedia centers for teaching and for creating awareness among the staff nurses regarding safe handling and administration of chemotherapeutic drug.

- These study findings will identify the present knowledge about safe handling and administration of chemotherapeutic drug among staff nurses to know extent of necessary information to be given.

- This study will motivate other investigator to conduct future studies regarding this topic.

- This study will help the nurse researchers to develop insight into the developing module and set information towards awareness about safe handling and administration of chemotherapeutic drug and prevention of complication.

LIMITATIONS

The study had following limitations,

- Random selection was not done.
- Study was done on limited sample
- Experience level of investigator

- Sample size was small so the generalization of the findings is limited.

- The data collection tool used in the investigation were prepared for this purpose and used for the first time.

RECOMMENDATIONS

- Based on the research findings the following recommendations can be made;

- The same study can be replicated on a sample and also at different settings.

- A descriptive study on assessing the knowledge of staff nurses on safe handling and administration of chemotherapeutic drug and other practice can be done.

- A structure teaching programme on safe handling and administration of chemotherapeutic drug can be prepared and given to the staff nurses, so that they can impact knowledge to all staff nurses.

- The effectiveness of various methods of teaching like interactive AV aids instruction, self-instructional module about safe handling and administration of chemotherapeutic drug, in implementing the knowledge of staff nurses and their practice can be tested and evaluated through the research

CONCLUSION

The following conclusion was drawn from the following study.

Nursing administration plays an important role on supervision and management of nursing professional in order to improve their knowledge and practice, skills and stay aware of the latest advancement in the technology to safe handling and administration of chemotherapeutic drugs among the hospital. Nursing research essentially is a problem solving process; nurses have to gather information regarding facts, ethical issues about safe handling and administration of chemotherapeutic drugs and change practices based on scientific knowledge.

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APPENDIX – I

LETTER SEEKING PERMISSION TO CONDUCT MAIN STUDY

From:
301612652
II year M.Sc (N) (Medical Surgical Nursing),
Sre sakthimayeil institute of nursing and Research,
(J.K.K.Nattaraja Educational Institutions),
Kumarapalayam,Namakkal (dt).

To :

Forwarded Through
The Principal
Sre Sakthimayeil institute of nursing and Research ,
(J.K.K.Nattaraja Educational Institutions),

Respected Sir/Madam,

SUB: **Requesting permission to conduct main study**

I am 301612652 II year M.Sc (N) student of Sre sakthimayeil institute of nursing and Research ,(J.K.K.Nattaraja Educational Institutions), Kumarapalayam. I have selected the below mentioned topic for the research project to be submitted to as the partial fulfilment of university requirement for degree in Master of Nursing .
Title "A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".
Regarding this project, I am in need of your esteemed help and co-operation as I am interested in conducting the study in your institution. Hence, I request your good self to kindly permit me to conduct the proposed study under your jurisdiction and provide the necessary facilities for the study. Kindly oblige and do the needful.

Thanking you

Yours faithfully

(301612652)

PRINCIPAL
SRESAKTHIMAYEIL INSTITUTE OF
NURSING AND RESEARCH
KOMARAPALAYAM - 638 183

SRESAKTHIMAYEIL INSTITUTE OF NURSING AND RESEARCH • KOMARAPALAYAM-638183 •

APPENDIX – II

LETTER GRANTING PERMISSION TO COLLECT DATA FOR RESEARCH STUDY

From
301612652
II year M.Sc (N) (Medical Surgical Nursing),
Sre sakthimayeil institute of nursing and Research ,
(J.K.K.Nattaraja Educational Institutions),
Kumarapalayam,Namakkal (dt).

To
Dr.Vijayakumar Chokkan,
Director of Medical Services,
SIMS Hospitals,
Vadapalani, Chennai – 600 026.

PRINCIPAL
SRESAKTHIMAYEIL INSTITUTE OF
NURSING AND RESEARCH
KOMARAPALAYAM - 638 183

Respected Sir/Madam,

SUB: **Requesting permission to conduct Research study**

I would like to bring to your kind notice that 301612652 M.Sc.(N) II YEAR student of Sre Sakthimayeil institute of nursing and Research ,Kumarapalayam, conducting a research on topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".** For the purpose of submission to the Tamil Nadu Dr.M.G.R, Medical University, Chennai, as a the partial fulfilment of university requirement for degree in Master of Nursing.

I Kindly request you to grant me permission to conduct this study in hospital, Kerala. Kindly do the needful.

Thanking you

Dr. VIJAYAKUMAR CHOCKKAN
MBBS., M.Sc., Ph.D., Neurosciences (Canada)
Director of Medical Services
SRM Institutes for Medical Science
Vadapalani, Chennai - 600 026.

SRESAKTHIMAYEIL INSTITUTE OF NURSING AND RESEARCH * KOMARAPALAYAM-638183 *

Yours faithfully

(301612652)

APPENDIX – III

LETTER REQUESTING OPINION AND SUGGESSTIONS OF EXPERTS FOR CONTENT VALIDITY TOOL

From
301612652
II year M.Sc (N) (Medical Surgical Nursing),
Sre sakthimayeil institute of nursing and Research ,
(J.K.K.Nattaraja Educational Institutions),
Komarapalayam,Namakkal (dt).

To

Through: The Principal
Respected Sir/Madam,

SUB: Content Validity – Requesting – valuable opinion & suggestions regarding

I am final year M.Sc (N) student of Sre sakthimayeil institute of nursing and Research, (J.K.K.Nattaraja Educational Institutions), Kumarapalayam. In partial fulfillment of M.Sc (N) programme , I have selected the topic mentioned below for the research project which has to be submitted to the Tamil Nadu Dr.M.G.R Medical University .

Hence I request your good self to validate the tool & give your valuable opinion &suggestions for necessary modification of the same.

"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".

Thanking you in anticipation

Encl:Tool

Yours faithfully

(301612652)

PRINCIPAL
SRESAKTHIMAYEIL INSTITUTE OF
NURSING AND RESEARCH
KOMARAPALAYAM - 638 183

SRESAKTHIMAYEIL INSTITUTE OF NURSING AND RESEARCH • KOMARAPALAYAM-638183 •

APPENDIX –IV

LIST OF EXPERTS

1. **Dr.Mrs.Jamunarani.R.M.Sc,(N),Ph.D**
   Principal,
   Sresakthimayeil Institute of Nursing and Research,
   Kumarapalayam.

2. **Prof.Mrs.B.Gowri.M.Sc,(N).**
   Research Guide,
   Sresakthimayeil Institute of Nursing and Research,
   Kumarapalayam.

3. **Dr.Vijayakumar Chockkan, MBBS, M .Sc.,**
   Ph.D., Neurosciences, (Canada),
   Director of Medical Services,
   SRM Institute for Medical Science,
   Vadapalani, Chennai – 600 026.

4. **Dr.Ranjankumar Mohapatra, MD (Gen.Med), DM (Med.Onco)**
   Director & Senior Consultant,
   Medical Oncology & BMT,
   SRM Institute for Medical Science,
   Vadapalani, Chennai – 600 026.

5. **Dr,Gracy,M.Sc,(N),Ph.D.**
   Professor,
   Dhanvantri College of Nursing,
   Pallakkapalayam..

6. **Mrs.Chandramathi,M.Sc,(N)**
   Professor,
   Dhanvantri College of Nursing,
   Pallakkapalayam..

APPENDIX –V

CONTENT VALITIDY CERTIFICATE

NAME : **Dr.Vijayakumar Chockkan, MBBS, M.Sc., Ph.D., Neurosciences, (Canada),**

DESIGNATION : **Director of Medical Services**

NAME OF THE COLLEGE: SRM Institute for Medical Science, Vadapalani, Chennai – 600 026.

I hereby certify that I have validated the tool of 301612652, M.SC(N), MEDICAL SURGICAL NURSING., II YEAR student Sresakthimayeil Institute of Nursing and Research, Kumarapalayam, who is undertaking the dissertation work on **"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".**

Dr. VIJAYAKUMAR CHOCKKAN
MBBS., M.Sc., Ph.D., Neurosciences (Canada)
Director of Medical Services
SRM Institutes for Medical Science
Vadapalani, Chennai - 600 026.

CONTENT VALITIDY CERTIFICATE

NAME : **Dr.Ranjankumar Mohapatra, MD (Gen.Med), DM (Med.Onco)**

DESIGNATION : **Director & Senior Consultant Medical Oncology & BMT,**

NAME OF THE COLLEGE: SRM Institute for Medical Science, Vadapalani, Chennai – 600 026.

I hereby certify that I have validated the tool of 301612652, M.SC(N), MEDICAL SURGICAL NURSING., II YEAR student Sresakthimayeil Institute of Nursing and Research, Kumarapalayam, who is undertaking the dissertation work on **"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".**

CONTENT VALITIDY CERTIFICATE

NAME : Mrs.Gracy,Ph,D.

DESIGNATION : Professor

NAME OF THE COLLEGE: Dhanvantri college of nursing

I hereby certify that I have validated the tool of 301612652, M.SC(N) MEDICAL SURGICAL NURSING., II YEAR student Sresakthimayeil Institute of Nursing and Research, Kumarapalayam, who is undertaking the dissertation work on "**A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".**

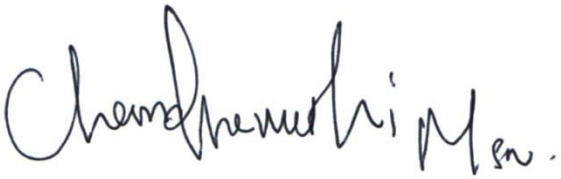
CONTENT VALITIDY CERTIFICATE

NAME: Mrs.Chandramathi,M.Sc,(N)

DESIGNATION: Professor

NAME OF THE COLLEGE: Dhanvantri college of nursing

I hereby certify that I have validated the tool of 301612652, M.SC(N)MEDICAL SURGICAL NURSING., II YEAR student Sresakthimayeil Institute of Nursing and Research, Kumarapalayam, who is undertaking the dissertation work on "**A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI".**



Signature of the expert

APPENDIX – VI

CERTIFICATE BY THE ENGLISH EDITOR

This to certify that the dissertation entitled **"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI"** is a bonafied research work done by 301612652,II year M,Sc.Nursing student Sresakthimayeil Institute of Nursing and Research, (JKK,Nattaraja Educational Institutions) Kumarapalayam**.**

APPENDIX – VII

CERTIFICATE BY THE STATISTICIAN

This to certify that the dissertation entitled **"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES IN SELECTED HOSPITAL, CHENNAI"** has been statistically analyzed under the consultation and guidance of the statistician has been statistically analyzed under the consultation and guidance of the statistician.

Signature of the Statistician

(K. DHANAPAL)

APPENDIX – VIII

DATA COLLECTION QUESTIONNAIRE

SECTION A: DEMOGRAPHIC DATA

QUESTIONS RELATED TO PERSONAL INFORMATION PUT

TICK ON THE OPTION WHICH IS FIT FOR YOU.

---

1. Name :

2. Age in years :

a) 21 – 25 years ☐

b) 26 – 30 years ☐

c) Above 30 years ☐

3. Gender :

a) Female ☐

b) Male ☐

4. Religion :

a) Hindu ☐

b) Christian ☐

c) Muslim ☐

5. Educational status :

a) B.Sc. (N) ☐

b) GNM ☐

c) M.Sc. (N) ☐

6. Year of experiences :

a) Less than 2years ☐

b) 2-3years ☐

c) Above 3 years ☐

7. Have you attended any additional training PROGRAMME on IV chemotherapy?

a) Yes ☐

b) No ☐

SECTION B

QUESTIONS RELATED TO CHEMOTHERAPY OVERVIEW, AND MODE OF EXPOSURE

1.What is chemotherapy?

a) Drug that control tumor growth ☐

b) Drug that improve immunity ☐

c) Drug that increase the size of the cells ☐

d) Drug that reduce blood pressure level ☐

2.Chemotherapy may be used conventionally to?

a) cure patients ☐

b) prolong survival ☐

c) palliative care symptoms control ☐

d) all the above ☐

3. This type of chemotherapy is prescribed with the intention of curing?

a] immunosuppressive ☐

b]palliative ☐

c] adjuvant ☐

d] primary ☐

4.Howmany phases of cell cycle is there?

a) 1 ☐

b) 3 ☐

C) 5 ☐

d) 7 ☐

5. Modes of contact for drug exposure ?

a] Absorption ☐

b] Inhalation ☐

c] Ingestion ☐

d] All the above ☐

6**.Neo-adjuvant chemotherapy means ?**

a]make a tumor smaller before surgery ☐

b] destroy the tumor after surgery ☐

c] use chemotherapy with radiotherapy ☐

d] none of the above ☐

7. Which one of the following site has least risk for extravasation ?

a) Wrist ☐

b) Forearm ☐

c) Antecubital fossa ☐

d) Median cubital ☐

8.Direct contact with chemotherapy drug by?

a] handling ☐

b]reconstituting ☐

c]administering ☐

d]all the above ☐

QUESTIONS RELATED TO SAFTY MEASURES DURING HANDLING OF CHEMOTHERAPY

---

9. Prior to administration, Cytotoxic drugs need to be identified as either a vesicant or irritant because?

A. You need to know in what order to administer the drugs ☐

B. If the drug extravasates, you need to know how to manage this ☐

C. This will tell you if the drug can be given as a bolus or infusion ☐

D. Vesicants require more antiemetics to be given ☐

10. Prior to administering chemotherapy, the nurse must ensure that the patient has ?

A. Signed consent ☐

B. Had appropriate education on effects/side effects and precautions to take ☐ ☐

C. Has appropriate venous access with established blood back flow ☐

D. Had antiemetics and/or premed ☐

E. All of the above ☐

11. What personal protective equipment does the nurse need to wear when administering chemotherapy?

A. None at all ☐

B. Plastic apron and non-sterile gloves ☐

C. Long sleeved impermeable gown, purple nitrile gloves. Optional to wear goggles and mask. ☐

D. Plastic apron, purple nitrile gloves, goggles and mask. ☐

12. When checking the drug you need to ensure ?

A. The BSA is correct and there has been no dose modification ☐

B. You have the right drug, right route, right dose, right day ☐
and time, within the expiry date and it has been rounded correctly

C. The prescriber is authorised to prescribe chemotherapy and ☐
their signature is legible

D. You have identified the drug as an irritant or vesicant and ☐
reviewed the allergy history of the patient E. You have enough knowledge about the drug including effects and side effects before you give it

E. All of the above ☐

13.Outline of Error-Prevention Measures ?

A. Educating Health Care Providers ☐

B. Verifying the Dosage ☐

C. Establishing Dosing Limits ☐

D. All the above ☐

14.The recommended location for chemotherapy preparation is?

A. Quit ,low traffic room ☐

B. Ordinary room ☐

C. Opened room ☐

D. All the above ☐

QUESTIONS RELATED TO HAZARDOUD EFFECTS AND DISPOSING OF CHEMOTHERAPY

15. Nausea and vomiting is an expected said effect of chemotherapeutic drug use. Which of the following drug should be administered to a client on chemotherapy to prevent nausea and vomiting?

a] Metochlopramide ☐

b] Succimer ☐

c] Anastrazole ☐

d] Busulfan ☐

16.ppe should be removed in which order?

a] gown,goggles,face shields,gloves ☐

b] face shields,gloves,gown.goggles ☐

c] gloves,gown,goggles,face shields ☐

17. Most common site of metastasis in breast cancer is?

a) lung ☐

b) liver ☐

c) bone ☐

d) brain ☐

18.A client taking a chemotherapeutic agent understands the effects of therapy by stating:

a]I will avoid eating hot and spicy food. ☐

b] I should stay in my room all the time ☐

c] I should stay limit my fluid intake to about 500 ml per day ☐

d] I should notify the physician immediately if a urine color change is observed ☐

19. Which sign or symptom is the most reliable early indicator of infection in a client with neutropenia?

a]Fever ☐

b]Chills ☐

c]Dsypnea ☐

d]Diaphoresis ☐

20. A client's absolute neutrophil count is less than 1000/mm3 during a course of chemotherapy. Which of the following interventions would be most appropriate for the nurse to implement?

a]Wearing a gown and mask while caring for the client ☐

b]Washing hands before entering the room ☐

c]Limiting visitors ☐

d]Contacting the physician to obtain an order for erythropoietin ☐

21.The characteristic toxicity of doxorubicin is?

a]kidney damage ☐

b]liver damage ☐

c]cardiomyopathy ☐

d]pulmonary fibrosis ☐

22. The most common complication that requires alteration of planned chemotherapy regimen is which of the following?

a]pulmonary fibrosis ☐

b]gastrointestinal ulceration ☐

c]hematologic suppression ☐

d]hepatotoxicity ☐

23.which one of the following drug is causes for peripheral toxicity?

a]vinblastine ☐

b]5-fu ☐

c]leucovorin ☐

d]cyclophosphamide ☐

24.Which container is used to dispose chemotherapy waste ?

a] yellow ☐

b] green ☐

c] red ☐

d] black ☐

25. The most common side effects of chemotherapy administration is ?

a)nausea ☐

b)alopecia ☐

c)myelo suppression ☐

d)renal dysfunction ☐

QUESTIONS RELATED TO CHEMOTHERAY DRUG

---

26. Which of the following chemotherapeutic agents would provide only a moderate incidence for alopecia?

a] Daunorubicin ☐

b] Etoposide ☐

c] Floxuridine ☐

d] Paclitaxel**8** ☐

27.What is the chemo drug called the Red Devil ?

a] docetaxel ☐

b] adriamycin ☐

c] oxaliplatin ☐

d] topotecan ☐

28.The chemotherapeutic agent most commonly administered by continue infusion is?

a) ara-c ☐

b) 5fu ☐

c) cisplatin ☐

d) etoposide ☐

29. Cisplatin is infused over ?

a] 24 hrs ☐

b] 6 hr ☐

c] 4 hr ☐

d] 2 hr ☐

30. Which one of the following IV fluid is used to dilute Inj. Cisplatin?

a) Ringer lactate ☐

b) 5% Dextrose ☐

c) Normal saline ☐

d) 10% Glucose ☐

APPENDIX – IX

LESSON PLAN ON STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SAFE HANDLING AND ADMINISTRATION OF CHEMOTHERAPEUTIC DRUGS AMONG STAFF NURSES

Topic	: Safe handling and administration of chemotherapeutic drugs
Group	: Staff Nurses
Number of participants	: 30
Venue	: SIMS Hospital, Chennai.
Duration	: 50 min
Method of teaching	: Lecture cum discussion
AV Aids used	: LCD Projector, OHP, Charts

GENERAL OBJECTIVES:

Staff nurses should be aware safe handling and administration of chemotherapeutic drugs.

SPECIFIC OBJECTIVES:

At the end of the teaching staff nurse can able to understand,

- Define of chemotherapy & cancer
- List the mode of chemotherapy
- Explain the how do the drug work
- Describe the method of giving chemotherapy
- Lists the three most common ways of giving chemotherapy
- Explain about safe handing of chemotherapeutic drugs, purpose, responsibilities, laminar good
- Enumerate the side effects of chemotherapy drug
- Mention the chemo -classification based on the nature of drugs
- Explain the waste management of chemotherapeutic drugs

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
1.	4 min.	-Define of chemotherapy & cancer	**MEANING OF CANCER** • Cancer is the name given to a group of diseases that occur in any organ of the body • It is the abnormal or uncontrolled growth of cells • Each cell in the body has genes **Development of cancer** • They develop when a single cell's genes develop a fault and are unable to regulate cell division • The cell begins to divide uncontrollably • Developing into a lump known as a tumour **Cancer cells:** • Carry on reproducing • Ignore signals from other cells around them • Do not stick together, so they can move around the body	Explaining about the meaning of cancer.	Listening	Computer	What is the meaning of cancer?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			• Remain immature • Do not die if they move to another part of the body				
2.	3 min.	List the mode of chemotherapy	**MODES OF CHEMOTHERAPY** • **Primary Chemotherapy** - chemotherapy is used as the sole anti-cancer treatment in a highly sensitive tumor types – Example – CHOP for Non-Hodgkins lymphoma • **Adjuvant Chemotherapy** – treatment is given after surgery to "mop up" microscopic residual disease – Example– Adriamycin, cyclophosphamide for breast cancer • **Neoadjuvant chemotherapy** – treatment is give before surgery to shrink tumor and increase chance of successful resection	Describe the modes of chemotherapy	Listening	Computer	What are the modes of chemotherapy?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			– Example – Adriamycin, ifosfamide for osteosarcoma • **Concurrent chemotherapy** – treatment is given simultaneous to radiation to increase sensitivity of cancer cells to radiation – Example – Cisplatin, 5-fluourouracil, XRT for head and neck tumors				
3.	3 min.	Explaining the meaning of chemotherapy.	**MEANING OF CHEMOTHERAPY** • Chemotherapy is a term used to describe any treatments that utilizes the introduction of chemical agents to an organism to help control, stop and or terminate the rapid growth of cells. This treatment is used for cancers and similar ailments……. • However it is slightly more complex, not all cancer killing drugs are classed as chemotherapy.	Explaining the meaning of chemotherapy.	Listening	Computer	What is chemotherpay?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			• Such as Interferon and Monoclonal antibodies which are classed as Immunotherapy. • There are 60 types of chemotherapy currently available and new ones being developed all the time.				
4.	5 mins.	Explain the ways of giving chemotherapy.	**Ways of giving chemotherapy....** • In order to damage and kill the cancer cells, the drugs must be absorbed into your blood and carried throughout your body. • The way chemotherapy is given depends on • The type of cancer. • The drugs. (for example, some must be injected and some can be taken by mouth) **The three most common ways of giving chemotherapy are:-** • Intravenous injection • Orally	Explaining the ways of giving chemotherapy.	Listening	Computer	How you can give the chemotherapy?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			• Intravenous infusion **Less often drugs can be injected:-** • Intramuscularly / subcutaneously • Intrathecally • Intra-arterial • Intracavitary (intravesical, intraperitoneal, intrapleural) • Intratumoural or intralesional				
5.	5 mins.	Explain about safe handing of chemotherapeutic drugs, purpose, responsibilities, laminar good	**Safe Handling of Cytotoxic Drugs** **Purpose:** • To provide nurses and pharmacists (who are involved in chemotherapy preparation) with guidelines for the safe handling of cytotoxic drugs during the preparation, transportation, and administration of chemotherapy. **Responsibilities:** • Admix all chemotherapeutic agents in a	Describing the purpose and responsibilities of safe handling of c	Listening	Computer	Why we need to give attention to safe handling of cytotoxic drugs?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			biological safety cabinet (laminar air flow with HEPA filtration) that meets standards and has been inspected properly. • All admixing of chemotherapeutic agents must be done in the pharmacy by a well- trained pharmacist.	ytotoxic drugs.			
6.	6 mins.	Brief description the flow chart of laminar hood usage	**LAMINAR HOOD USAGE FLOWCHART** Check the Consultant order & indent the medicine. ↓ Switch on the UV light & leave it for 30 minutes ↓ Arrange the articles needed to mix the medicine in a clean tray & wear mask ↓ After 30 minutes, switch off the UV light , switch on the normal light for visualization & keep the vacuum on (the pressure should be above 10 -15 mm of H2O)	Explaining	Listening	Computer	Draw a flow charge of laminar hood usage.

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			↓ Keep the tray in the laminar hood, through the side door & close it. ↓ Mix the drug with gloved hands which is fixed in the laminar hood ↓ Switch off the vacuum & normal light after keeping the tray into the side door. Close the inner door. ↓ Take out the medicine through the side door. ↓ Transport the medicine in the closed bag system to the patients room				
7.	4 min.	Route-Specific Nursing Considerations	**Route-Specific Nursing Considerations and Interventions for Cytotoxic Drug Administration** **I. Oral route:**	Explaining	Listening	Computer	What are the Nursing Consideratio

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
		and Interventions for Cytotoxic Drug Administration	**II. Subcutaneous (SC) & Intramuscular (IM) Routes.** **III. Intravenous (IV) administration**				ns and Interventions for Cytotoxic Drug Administration
8.	6 mins.	Enumerate the side effects of chemotherapy drug	**SIDE EFFECTS OF CHEMOTHERAPY** • Nervous system o Cranial nerve defects o Peripheral neuropathy o Cognitive & behavioral changes • Sensory System o Ototoxicity o Conjunctivitis o Photophobia • Cardio-Pulmonary System	Describing the side effects of chemotherapy	Listening	Computer	List out the side effects of chemotherapy?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			○ Pneumonitis ○ Pulmonary Edema ○ Acute Cardiomyopathy • Renal System ○ Renal Tubule Impairment ○ Tumor Lysis Syndrome ○ Hemorrhagic Cystitis • Integumentry System ○ Mucosal Changes ○ ECutaneous Changes ○ Extravasation ○ Allergic Reaction • Haematopoetic System ○ Anaemia ○ Neutropenia ○ Trombocytopenia ○ Immunosupression				

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation

			• Coagulation System
			  o Deep Vein Thrombosis
			  o Cerebral Vascular Accidents
			• Endocrine System
			  o Insulin Insufficiency
			  o Diabetes insipidus
			  o SIADH
			• Hematopoetic System
			  o Myelosupression
			  o Leukopenia,
			  o Aaemia & Thrombocytopenia
			• Gastro Intestinal system
			  o Nausea & Vomiting
			  o Constipation Diarrohea
			  o Chemical hepatitis
			  o Pancreatitis, Altered Nutrition				

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
9.	4 mins.	Listing the classification of chemotherapy.	**CHEMO-CLASSIFICATION BASED ON THE NATURE OF DRUG** **VESICANTS** • Actinomucin-D • Amsacrine • Carmustine • Daunorubicin • Doxarubin • Epirubicin • Idarubicin • Vincristine • Vinblastin	Listing the classification of chemotherapy.	Listening	Computer	What the classification of chemotherapy.
10.	3 min.	Meaning and management of Extravasation	**Management of Extravasations** **Extravasation:** Leakage or infiltration of a vesicant drug or irritant agent from the vein into the subcutaneous tissue which may result in pain, necrosis or sloughing	Describing the Meaning and managem	Listening	Computer	What is extravasation and its management ?

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			of tissues. Nerves ,tendons, joints ,some drugs (vesicants) can cause extensive necrosis and the damage can continue for several weeks or months after the incident. The extent of trauma may result in surgical excision of the affected area, skin grafting and functional loss .	ent of Extravasation			
11.	3 min.	Listing the risk factors of extravasation.	**Risk Factors for extravasation (Patient-Related):** • Vein size & quality - small - fragile - sclerosed • Vascular access device • Obstructive process such as lymphedema • Peripheral neuropathy • Duration of tissue exposure- prolonged • Vein puncture site- at the joints **Immediate manifestations of extravasations:** • Severe pain or burning • Blotchy redness at site	Listing the risk factors of extravasation.	Listening	Computer	List out the risk factors of extra vacation.

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			• Severe swelling • Loss of blood return in the IV line				
	3 min.	Explain the waste management of chemotherapeutic drugs	**Management of Extravasation:** • Stop administration immediately & notify physician • Reassure patient • Place a piece of dry gauze 2X2 between skin and IV cannula • Disconnect IV tubing from cannula and connect a sterile cap or covered needle to the end of tubing maintaining a safe-handling technique • Attach 1cc syringe directly to the IV cannula & attempt to gently aspirate as much as possible (3-5cc drug/blood) • Elevate the extremity and follow medical instructions .	Describing the Management of extravasation.	Listening	Computer	What is the management of extravasation.

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
			Waste Management of Cytotoxic Drugs • All staff that has contact with cytotoxic drugs should follow the guidelines regarding the waste management of cytotoxic drugs. • Don't clip or recap needles or break used empty syringes. • Place all needles that that are contaminated with cytotoxic drugs in properly labeled sharp container (Yellow bag with the biohazard sign). • Place all non-sharp disposable contaminated materials like IV set, syringes…in a black plastic bag labeled with the Biohazard sign or in a properly labeled plastic bag. • place contaminated linen and clothes in a closed plastic black bag or in a properly labeled plastic bag.				

S. No.	Time	Specific Objectives	Content	Teacher Activity	Learner Activity	AV Aids	Evaluation
	1 min .		**CONCLUSION** At the end of this lesson plan, we can get the knowledge regarding meaning of chemotherapy, modes of chemotherapy, how do the drug work, way of giving chemotherapy, the three most common ways of giving chemotherapy, safe handling of chemotherapeutic drugs, purpose, responsibilities, laminar good, side effects of chemotherapy drug, chemo-classification based on the nature of drugs, waste management of chemotherapeutic drugs				

APPENDIX – X

PHOTOGRAPHS & CD